AMENDMENT # 9 TO THE

FISHERY MANAGEMENT PLAN

FOR ATLANTIC SURFCLAM AND OCEAN QUAHOG FISHERIES

MAY 1996

Mid-Atlantic Fishery Management Council

in cooperation with the

National Marine Fisheries Service

and the

New England Fishery Management Council

Draft adopted by MAFMC: 22 February 1996
Final adopted by MAFMC: 16 May 1996
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2. SUMMARY

The Amendment is intended to bring the Fishery Management Plan for the Atlantic Surfclam and Ocean Quahog Fisheries (FMP) into compliance with the guidelines in 50 CFR 602 which mandate a quantifiable definition of overfishing in all FMPs. The FMP modified by this Amendment was implemented on 17 November 1977. The Amendment does not change the MSYs, OYs, or quota setting process and, therefore, does not alter the FMP's consistency with any National Standard. National Standard 1 is the only standard affected by the redefinition of overfishing produced through this Amendment and since the Council's time-horizon, quota-setting policy is more conservative than the adopted rate-based alternative overfishing definition, conservation and management measures for these resources will continue to prevent overfishing. The Council's quota setting policy will remain the annual "target" harvest level, while the new rate based overfishing level will be the "threshold" of harvest levels beyond which the long-term productive capability of the stock is jeopardized.

The objectives of the FMP are:

1. Conserve and rebuild Atlantic surfclam and ocean quahog resources by stabilizing annual harvest rates throughout the management unit in a way that minimizes short term economic dislocations.

2. Simplify to the maximum extent the regulatory requirement of surfclam and ocean quahog management to minimize the government and private cost of administering and complying with regulatory, reporting, enforcement, and research requirements of surfclam and ocean quahog management.

3. Provide the opportunity for industry to operate efficiently, consistent with the conservation of surfclam and ocean quahog resources, which will bring harvesting capacity in balance with processing and biological capacity and allow industry participants to achieve economic efficiency including efficient utilization of capital resources by the industry.

4. Provide a management regime and regulatory framework which is flexible and adaptive to unanticipated short term events or circumstances and consistent with overall plan objectives and long term industry planning and investment needs.

The management unit is all surfclams (*Spisula solidissima*) and all ocean quahogs (*Arctica islandica*) in the Atlantic EEZ.

2.1. Overfishing Definitions

Overfishing is currently defined as the catch of surfclams or ocean quahogs exceeding the annual quota for each species. The provisions of the FMP concerning annual quotas, vessel allocations, cage tags, minimum size limit, closed areas, and reporting have prevented overfishing, given the existing stock conditions during the past nearly two decades of management for these two species. The NMFS has concluded that the MSY-based/relatively constant harvesting strategy used as the previous overfishing definition is no longer acceptable since it depends on the Council taking appropriate action rather than relying on a quantifiable rate-based standard.

The adopted overfishing definition for surfclams is a fishing mortality rate of $F_{20\%}$ (20% of the maximum spawning potential, or MSP), which equates to an annual exploitation rate of 15.3%. The adopted overfishing definition for ocean quahogs is a fishing mortality rate of $F_{25\%}$ (25% of the MSP), which equates to an annual exploitation rate of 4.3%.

Alternative overfishing definitions for surfclams are:

1. A fishing mortality rate of F_{max}, which corresponds to an annual exploitation rate of 16.5%, and

2. The Council's surfclam quota setting policy, which is:

   OY = 1,850,000 - 3,400,000 bushels. Council policy is to set the quota within the OY range at a level that will allow fishing to continue at that level for at least 10 years. Within the above constraints, the quota is set at a level that will meet estimated annual demand.

Alternative overfishing definitions for ocean quahogs are:

1. A fishing mortality rate of $F_{20\%}$, which corresponds to an annual exploitation rate of 5.8%.

2. A fishing mortality rate of $F_{30\%}$, which corresponds to an annual exploitation rate of 3.5%.

3. A fishing mortality rate of F_{max}, which corresponds to an annual exploitation rate of 6.8%, and

4. The Council's ocean quahog quota setting policy, which is:

   OY = 4,000,000 - 6,000,000 bushels. The Council policy is to set the quota within the OY range at a level that will allow fishing to continue at that level for at least 30 years. Within the above constraint, the quota is set at a level that will meet estimated annual demand.

The Council has had a 10 year supply horizon for surf clams and a 30 year supply horizon for ocean quahogs as its policy for annual quota setting for nearly a decade. This policy can remain intact for the annual quota setting and serves as what is referred to as a "target". The overfishing level is a "threshold" beyond which the long-term productive capability of the stock is jeopardized. The NMFS is encouraging the Council not to have the target and the threshold equal because the overfishing thresholds are intended to and, could become, constraining if exceeded. Using this Amendment's adopted overfishing definition for both surfclams and ocean quahogs would not be constraining to the continued use of the 10 year clam horizon nor the 30 year ocean quahog horizon. The Council's quota setting process is more conservative than the rate-based overfishing levels, given the current resource conditions.

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4. INTRODUCTION

4.1. DEVELOPMENT OF THE PLAN

The Mid-Atlantic Fishery Management Council (Council) has been involved in surfclam and ocean quahog management since its first meeting (September 1976), when it was discussed that the surfclam fishery should be the first for which a plan should be developed. At the February 1977 meeting the Council voted to accept responsibility for the surfclam plan and began discussion of possible management measures. From April through August 1977 every meeting included a debate over possible management measures. Public hearings were conducted during June 1977, with major revisions proposed to the management system based on public comments. The original FMP (MAFMC 1977) was approved in November 1977 for the period through September 1979. Amendment 1 extended it through 31 December 1979. It contained specific quarterly quotas for surfclams (350,000 bushels (bu) each for October-December and January-March and 550,000 bu each for April-June and July-September) and an annual quota (3,000,000 bu) for ocean quahogs. The effort limitation, permit, and logbook provisions were included. The FMP (MAFMC 1977) also instituted a moratorium in the surfclam fishery (all surfclams, since there was no New England Area) for one year to allow time for the development of an alternative limited entry system "such as a stock certificate program".

Amendment 1 (MAFMC 1979a) extended the FMP for ninety days, until the end of 1979 (primarily to allow for completion of the latest stock assessment). It added processor reporting requirements and removed the requirement that each quarter begin with four days of fishing (even though the stock was depressed, the excess harvesting capacity led to closures very quickly). The moratorium was continued.

Amendment 2 (MAFMC 1979b) extended the FMP through the end of 1981 and divided the surfclam portion of the management unit into the New England and Mid-Atlantic Areas. Annual quotas were: 25,000 bu of surfclams for the New England Area, 1.8 million bu of surfclams for the Mid-Atlantic Area, 3.5 million bu of quahogs for 1980, and 4 million bu of quahogs for 1981. The quarterly quotas in the Mid-Atlantic Area were: moving closer to equal (400,000 bu for the fall and winter quarters and 500,000 bu for the spring and summer quarters. The bad weather make up day was introduced. The moratorium was continued in the Mid-Atlantic Area.

Amendment 3 (MAFMC 1981), approved 13 November 1981, extended the FMP indefinitely. A 5.5" surfclam minimum size limit was imposed in the Mid-Atlantic Area. The surfclam fishing week in the Mid-Atlantic Area was expanded to Sunday-Thursday from Monday-Thursday. Quota setting was put on a framework basis with ranges of: 1.8-2.9 million bu for Mid-Atlantic Area surfclams, 25,000-100,000 bu for New England Area surf clams, and 4-6 million bu for ocean quahogs. The Council proposed a permit limitation system to replace the moratorium which was disapproved by NMFS. The NMFS extended the moratorium.

Amendment 4 was initiated in response to a closure of the New England Area to surfclam fishing during the second half of 1983. On 21 July 1983 the New England Council sent a letter to the Secretary of Commerce requesting Secretarial action to reopen the New England Area surfclam fishery. The Mid-Atlantic Council passed a motion in August 1983 recommending that the Secretary not accept the proposal of the New England Council. After receiving a letter from the Secretary on 6 September 1983 denying implementation of emergency action to reopen the surfclam fishery in the New England Area, work was begun to investigate methods for avoiding an extended closure in 1984. In November 1983 the Mid-Atlantic Council passed a motion authorizing the Regional Director and the New England Council to prepare an Amendment for the New England Area involving trip limits, quarterly quotas, or similar strategies to insure fishing throughout the year. A proposed Amendment 4 was drafted by the New England Council staff in cooperation with NMFS staff and hearings were held on 21 and 22 March 1984. At a joint meeting of the New England and Mid-Atlantic Councils in May 1984 representatives of the surfclam industry from both New England and the Mid-Atlantic presented revisions to the proposed regime. The Mid-Atlantic Council passed a motion to adopt the proposed Amendment 4 to the Surfclam and Ocean Quahog FMP as amended to provide that any unharvested portion of a bimonthly allocation be added to the immediately following bimonthly allocation rather than being prorated over all remaining bimonthly periods and that trip and weekly limits be by vessel classes based on relative fishing power using the following ratios: Class 1 = 1.0, Class 2 = 1.8, and Class 3 = 3.4, and that NMFS

use a rulemaking procedure to implement the Amendment on an emergency basis. The New England Council voted at the same meeting to adopt the Amendment.

The provisions of Amendment 4 were implemented on an emergency basis for 180 days beginning 1 July 1984, during which time the Amendment was finalized by the New England Council and submitted for Secretarial approval. However, it was determined that the document was not structurally complete for review.

Amendment 5 (MAFMC 1984), approved 28 February 1985, allowed for revision of the surfclam minimum size limit provisions, extended the size limit throughout the entire fishery, and instituted a requirement that cages be tagged.

Amendment 6 (MAFMC 1986) was begun in October 1984 following an exploratory fishery conducted on Georges Bank as a result of emergency regulations published 2 August 1984 (49 *FR* 30946- 30948), primarily to address problems associated with the development of a surfclam fishery on Georges Bank. At its October 1984 meeting the Council voted to divide the New England Area into the Nantucket Shoals and Georges Bank Areas, the dividing line being 69° longitude. At the same meeting the Council voted to approve revising proposed Amendment 4 so its provisions applied to that portion of the New England Area west of 69° longitude.

In response to the Council's recommendation that Amendment 4 be revised to apply only to that portion of the New England Area west of 69°, the New England Council held a hearing on 11 December 1984.

At its December 1984 meeting the Council adopted the provisions of Amendment 6. The Amendment was adopted by the Council for hearings in January 1985, with hearings held 18 and 19 February 1985. The Council adopted Amendment 6 for Secretarial approval at its March 1985 meeting. At that time Amendment 4 still had not been found structurally complete. Given the relationship between the provisions of Amendments 4 and 6, the decision was made to abandon Amendment 4 and the Mid-Atlantic Council would combine the provisions of Amendment 4 with the Mid-Atlantic Council's Amendment 6 in one document. The combination of Amendments 4 and 6 did not change any substantive provisions of either Amendment.

The Council was notified via a letter of 25 July 1985 that NMFS had partially approved Amendment 6. The letter from Acting Regional Director Richard H. Schaefer to Council Chairman Robert L. Martin stated in part:

"The measures in Amendment 6 that I disapproved are the Nantucket Shoals Area bimonthly quota guidelines and effort control measures, the one landing per day restriction applying to the Mid-Atlantic Area, the provision prohibiting the Regional Director from subdividing allowable fishing hours when the hours are set at 12 or less, and the portion of the notification provision prohibiting vessels that have fished in a notification zone from returning to fish in the same notification zone within that calendar month. The disapproval of the bimonthly guidelines for Nantucket Shoals removed the basis for adjusting the quotas between bimonthly periods when harvest either exceeds or falls short of quota. Therefore, this provision, while not specifically disapproved, can not be implemented on Nantucket Shoals at this time." (This measure was one developed jointly by the New England Council and the NMFS Northeast Regional Office.)

The Council revised Amendment 6 to replace the bimonthly quotas with quarterly quotas, eliminate the weekly landing limits for the Nantucket Shoals Area, clarify the quota adjustment provisions for the Nantucket Shoals and Georges Bank Areas, and present additional justification for the one landing per trip provision. The other disapproved provisions (prohibition on subdividing allowed fishing times under certain conditions and portions of the notification system) were deleted from the Amendment. The Amendment was approved on 9 April 1986 when the 60-day review period expired without action by NMFS.

Amendment 7 (MAFMC 1987) was developed to change the quota distribution on Georges Bank (from 20:40:40:20 to equal quarterly quotas) and revise the roll over provisions from one period to the next. This amendment was taken to public hearings in February 1987, approved by NMFS, and final regulations published on 24 July 1987.

Amendment 8 (MAFMC 1988) established an individual transferable quota (ITQ) system primarily to replace the regulated fishing time system in place in the Mid-Atlantic surfclam fishery. This fishery was operating under a moratorium on vessel permits. Allowable fishing time in this fishery went from 96 hours a week in 1978 to six 6 hour trips per quarter in 1988. The ITQ system essentially converted allowable fishing time into allowable individual levels of harvest. The Council had several alternatives under consideration during the development of Amendment 8 with respect to management of the New England surfclam fishery and the ocean quahog fishery. These fisheries were controlled through quotas prior to Amendment 8. The ocean quahog quota had never been fully harvested. Many felt that the Council should simply impose a moratorium on this fishery until such time as restraints on harvest were necessary. When such restraints were necessary, an ITQ system could have been imposed based on reported landings. The Council decided to bring the ocean quahog fishery under the ITQ system because it believed that the problems experienced in the surfclam fishery under the moratorium would simply be relived under a quahog moratorium.

The vessel owners that received allocation under the ITQ system were those whose vessels had reported landings under the mandatory logbook requirement that had been in place since 1978. All of the vessels that had reported landings were those that were involved in the commercial surfclam and ocean quahog fisheries prosecuted mainly off the Mid-Atlantic. These fisheries involved large vessels towing hydraulic dredges the catch from which is emptied into metal cages holding roughly 32 bushels. These cages are the industry standard that enable processors to handle large volumes of product given the limitations of processing plant size, vessel capacity, and stability as well as that of moving and hauling equipment.

Amendment 8 employed three formulae that gave participants in the Mid-Atlantic surfclam fishery, the New England surfclam fishery and the ocean quahog fishery, respectively, an allocation percentage. Initial allocation percentages were based largely on a vessel's average historical catch. The average catch was weighted with respect to Mid-Atlantic surfclam allocations and a vessel size factor was added in to calculate the initial allocation percentage. This percentage was applied to the annual quota to give the participant his/her allocation in bushels. This number was again divided by 32, the number of bushels in a standard cage used by the industry to determine the number of cage tags the participant was to be issued by the National Marine Fisheries Service.

A participant's bushel allocation will change in any year if the annual quota is revised. Since these allocations may be bought and sold, a participant's allocation may change as he/she purchases or sells allocation. Each transfer of allocation must be approved by the Regional Director. Allocation permits are modified by NMFS to reflect modifications to the participant's allocation percentage following a transfer of allocation. Monitoring the harvest of individual allocations and, in turn, the annual quota is facilitated by a cage tagging requirement and mandatory reporting by vessel owners and dealers with respect to the amount of surfclams and ocean quahogs landed and purchased. Amendment 8 also: (1) allowed for the minimum surfclam size to be suspended from year to year; (2) merged the New England and Mid-Atlantic surfclam areas into one management area; (3) authorized the Regional Director to issue shucking-at-sea permits to owners of surfclam vessels based upon certain conditions; and (4) empowered the Regional Director to authorize an experimental fishery to gather information necessary for management.

4.2. PROBLEM ADDRESSED BY THE AMENDMENT

Overfishing is defined in the current FMP (Amendment 8) as the catch of surfclams or ocean quahogs exceeding the annual quota for each species. The provisions of the FMP concerning setting annual quotas, making vessel allocations, requiring cage tags, minimum size limit, closed areas, and reporting were all believed to contribute to the prevention of overfishing. These overfishing definitions were based on an action of the Council taken in October 1989. The National Marine Fisheries Service recently concluded (Rosenberg *et al*, 1994) that the surfclam and ocean quahog overfishing definitions were deficient since they were dependent on the Council and NMFS selecting the appropriate quotas. This Amendment (Amendment 9) is designed solely to provide acceptable overfishing definitions for surfclams and ocean quahogs.

4.2.1. Why New Overfishing Definitions?

In 1989 NMFS published expanded regulations and guidelines (602 Guidelines) for implementation of the

Magnuson Fishery Conservation and Management Act (MFCMA) which mandated overfishing definitions in all FMPs. The MAFMC submitted overfishing definitions for our four FMPs (Surfclams and Ocean Quahogs, Atlantic Mackerel, Squid, and Butterfish, Bluefish, and Summer Flounder) by the required time of late 1990. In 1993 NMFS convened a panel of scientists from inside and outside the agency to review all of the Councils' definitions of overfishing and report on their strengths and weaknesses for conserving fishery resources.

This panel produced a report entitled *Scientific Review of Definitions of Overfishing in U.S. Fishery Management Plans* authored by Rosenberg *et. al* (1994). This report concluded in the evaluation of our surfclam/ocean quahog overfishing definition that:

"The overfishing definition itself places no restriction on the quota, and therefore must be termed 'risky'. While seemingly unambiguous (i.e., catch either is, or is not, in excess), there is no specific restriction on what is set to be the annual quota. This approach was rejected for many other FMPs. By itself, this definition offers no objective protection from overfishing. Its effectiveness depends entirely on competent management by the Council. Current management policy favors a supposedly risk-averse constant quota (MAFMC 1992) but is actually risk-prone in that the policy (a) is based on a highly speculative computer simulation, and (b) does not specify conditions explicitly requiring a reduction in ABC. The definition has no biological or theoretical content, and therefore cannot be called sensible from this point-of-view. An improved definition would codify the key biological elements in the FMP that protect against overfishing. Criteria such as a maximum wide-area average $F_{50\%}$ with a nominal age at recruitment seem feasible."

The overfishing definition that the panel evaluated was "Overfishing is defined as the catch of surfclams or ocean quahogs exceeding the annual quota for each species." A part of the problem with this overfishing discussion was that this panel-evaluated definition was not completely the Council's definition. Both species are managed through quantified MSYs, OYs and quotas. The MSYs are specified in the FMP (section 5.4 of Amendment 8 discussed an MSY estimate for surfclams of approximately 50 million lbs of shucked meats, while the MSY for ocean quahogs was approximately 60 million lbs of shucked meats). Both of these MSY figures correspond to the "long-term potential catch" estimates that are published in NMFS's *Status of the Fishery Resources off the Northeastern United States for 1994* (USDC 1995a). For ocean quahogs, the maximum OY was the same as the MSY, so there was a conservative bias built into the FMP as the MSY was not treated as an average but rather as a maximum. For surfclams, the maximum OY quantity was slightly larger than the MSY because of the evolution of the three management areas and separate quotas before implementation of Amendment 8 and quota consolidation. Both species are managed through annual quotas selected within the OY ranges. During the past several years the quotas have been below the MSY estimates.

The 14 August 1995 letter from A. Peterson to D. Keifer (Peterson pers. comm.) states that "Because of the shortness of the recruitment time series for surfclams, it is still not possible to derive meaningful estimates of F_{med} and MSY. However, as the time series of the DeLury analyses are extended backward, this may be possible in the future."

4.2.2. Overfishing Definition According to 602.11 of Guidelines

(a) Standard 1. Conservation and management measures shall prevent overfishing while achieving on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

(b) General. The determination of OY is a decisional mechanism for resolving the Act's multiple purposes and policies, for implementing an FMP's objectives, and for balancing the various interests that comprise the national welfare. OY is based on MSY, or on MSY as it may be adjusted under paragraph (d)(3) of this section. The most important limitation on the specification of OY is that the choice of OY -- and the conservation and management measures proposed to achieve it -- must prevent overfishing.

(c) Overfishing. (1) Overfishing is a level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis. Each FMP must specify, to the maximum extent possible, an objective and measurable definition of overfishing for each stock or stock complex covered by that FMP, and provide an analysis of how the definition was determined and how it relates to reproductive potential.

(2) The definition of overfishing for a stock or stock complex may be developed or expressed in terms of a minimum level of spawning biomass ("threshold"); maximum level or rate of fishing mortality; or formula, model, or other measurable standard designed to ensure the maintenance of the stock's productive capacity. Overfishing must be defined in a way to enable the Council and the Secretary to monitor and evaluate the condition of the stock or stock complex relative to the definition.

(3) Different fishing patterns can produce a variety of effects on local and areawide abundance, availability, size, and age composition of a stock. Some of these fishing patterns have been called "growth", "localized", or "pulse" overfishing; however, these patterns are not necessarily overfishing under the national standard 1 definition, which focuses on recruitment and long-term reproductive capacity.

4.2.3. Common Biological Reference Points

Most biological reference points deal with fishing mortality rates that may provide acceptable protection against growth overfishing and/or recruitment overfishing for a particular stock. They are usually calculated from equilibrium yield-per-recruit curves, spawning stock biomass-per-recruit curves and stock-recruitment data. Examples include $F_{0.1}$,F_{max}, $F_{20\%}$, and F_{msy}. Fishing mortality (F) is the part of the total mortality rate applying to a fish population that is caused by man's harvesting and is expressed as an instantaneous rate, which is different from an annual rate, which is the exploitation rate. The derivation of instantaneous rates is mathematically complex, but there is a relatively simple connection between them and the simpler annual rates. Instantaneous rates are used in stock assessments because they are mathematically easy to use (e.g., they can be added directly while percentages cannot). Exploitation rate is the proportion of a population at the beginning of a year that is caught during the year. For example, if we had a million clams on 1 January and took 200,000 clams during the year, the exploitation rate would be 0.20. At low mortality rates, the instantaneous and annual rates are similar (e.g. an annual mortality rate of 0.1 equals an instantaneous mortality rate of 0.1054). Table 1 lists the instantaneous fishing mortality and the exploitation rates considered as alternatives for this Amendment.

Clam abundance is a balance between the factors that act to increase the stock -- births and growth -- and factors that decrease population numbers -- natural and fishing mortality. Knowing the sources and levels of mortalities affecting populations is a critical ingredient of forecasting both landings and spawning stock sizes, and in evaluating the changes in populations that may be induced by regulations such as minimum clam sizes and quotas.

The F_{max} is the rate of fishing mortality, for a given exploitation pattern rate of growth and natural mortality, that results in the maximum level of yield-per-recruit. This is the point that defines growth overfishing.

The $F_{0.1}$ is the fishing mortality rate at which the increase in yield-per-recruit in weight for an increase in a unit-of-effort is only 10% of the yield-per-recruit produced by the first unit of effort on the unexploited stock.

The $F_{20\%}$ is the fishing mortality rate at which spawning per recruit is 20% of the maximum (20%maximum spawning potential). The $F_{30\%}$ is a lower fishing mortality level than is the $F_{20\%}$ and corresponds to 30% of the maximum spawning per recruit.

The F_{MSY} is the fishing mortality rate that produces the maximum sustainable yield (MSY). The Council has in the past attempted to manage these two mollusk resources at the long-term average yields approximating MSY. The problem lies in the fact that it is not currently possible to derive meaningful estimates of MSY (Peterson pers. comm.).

4.2.4. Council Policy

The Council has had a 10 year supply horizon for surf clams and a 30 year supply horizon for ocean quahogs as its policy for annual quota setting for nearly a decade. This policy can remain intact for the annual quota setting and serves as what is referred to as a "target". The overfishing level is considered a "threshold" beyond which the long-term productive capability of the stock is jeopardized. The NMFS is encouraging the Council not to have the target and the threshold equal because the overfishing threshold is intended to and

could become quite constraining if exceeded. Using this Amendment's adopted overfishing definition for both surfclams and ocean quahogs would not be constraining to the continued use of the 10 year clam horizon nor the 30 year ocean quahog horizon. The Council's quota setting process is more conservative than the rate-based overfishing levels, given the current resource conditions.

The Northeast Fisheries Science Center (Peterson pers. comm.) has been assisting the Council with this project and recommends that: "For each species, adoption of either F_{max} or $F_{20\%}$ as an overfishing definition would be consistent with optimal long-term exploitation from a yield standpoint."

The Council's Scientific and Statistical Committee (SSC) met on 6 September 1995 and reviewed the NEFSC's (Peterson pers. comm.) letter. The SSC recommended that the $F_{20\%}$ (MSP) be used for surfclams and an $F_{25\%}$ (MSP) be used for ocean quahogs. The SSC felt that an F based on maximum spawning potential was better for recruitment overfishing rather than an F based on yield-per-recruit (F_{max}) which is more often associated with growth overfishing. The $F_{25\%}$ for ocean quahogs, which is a more conservative (lower) fishing rate estimate was recommended because of the extreme longevity (200 years) relative to surfclams.

The Council discussed this issue 20 September and passed the following two motions:

"I move that the current Council policy for surfclams be expressed as an alternative for the overfishing definition. Alternative definitions should include $F_{20\%}$ and F_{max}. The Council's preferred alternative is $F_{20\%}$."

"I move that the current Council policy for ocean quahogs be expressed as an alternative for the overfishing definition. Alternatives include F_{max} , $F_{20\%}$, $F_{25\%}$, and $F_{30\%}$. The Council's preferred alternative is $F_{25\%}$."

The Council discussed the 14 May 1996 hearing on 15 May and adopted the preferred alternative overfishing definitions.

4.3. MANAGEMENT OBJECTIVES

The objectives of the Atlantic Surfclam and Ocean Quahog FMP are:

1. Conserve and rebuild Atlantic surfclam and ocean quahog resources by stabilizing annual harvest rates throughout the management unit in a way that minimizes short term economic dislocations.

2. Simplify to the maximum extent the regulatory requirement of surfclam and ocean quahog management to minimize the government and private cost of administering and complying with regulatory, reporting, enforcement, and research requirements of surfclam and quahog management.

3. Provide the opportunity for industry to operate efficiently, consistent with the conservation of surfclam and ocean quahog resources, which will bring harvesting capacity in balance with processing and biological capacity and allow industry participants to achieve economic efficiency including efficient utilization of capital resources by the industry.

4. Provide a management regime and regulatory framework which is flexible and adaptive to unanticipated short term events or circumstances and consistent with overall plan objectives and long term industry planning and investment needs.

4.4. MANAGEMENT UNIT

The management unit is all surfclams (*Spisula solidissima*) and all ocean quahogs (*Arctica islandica*) in the Atlantic EEZ.

5.0 DESCRIPTION OF THE STOCKS

This section of the FMP remains unchanged.

6.0 DESCRIPTION OF HABITAT

This section of the FMP remains unchanged.

7.0 DESCRIPTION OF FISHING ACTIVITIES

This section of the FMP remains unchanged.

8.0 DESCRIPTION OF ECONOMIC CHARACTERISTICS OF THE FISHERY

This section of the FMP remains unchanged.

9.0 FISHERIES MANAGEMENT PROGRAM

The sole purpose of this Amendment is to incorporate a rate-based, revised, overfishing definition for the surfclam and ocean quahog management.

9.1 MEASURES TO ATTAIN MANAGEMENT OBJECTIVES

Overfishing is currently defined as the catch of surfclams or ocean quahogs exceeding the annual quota for each species. The provisions of the FMP concerning annual quotas, vessel allocations, cage tags, minimum size limit, closed areas, and reporting have prevented overfishing, given the existing stock conditions during the past nearly two decades of management for these two species. The NMFS has concluded that the MSY-based/relatively constant harvesting strategy used as the previous overfishing definition is no longer acceptable since it depends on the Council taking appropriate action rather than relying on a quantifiable rate-based standard.

The Northeast Fisheries Science Center (NEFSC) has been assisting the Council with resolving the overfishing definition issue (Peterson pers. comm.). The Rosenberg *et al.* (1994) report and the advise from the NEFSC encouraged the Council to specifically use a "rate-based" overfishing reference point as opposed to the previously defined overfishing levels which were in terms of actual yield levels.

The adopted overfishing definition for surfclams is a fishing mortality rate of $F_{20\%}$, (20% of the maximum spawning potential, or MSP), which equates to an annual exploitation rate of 15.3%. The adopted overfishing definition for ocean quahogs is a fishing mortality rate of $F_{25\%}$, (25% of the MSP), which equates to an annual exploitation rate of 4.3%.

Alternative overfishing definitions (Appendix 1) for surfclams are:

1. A fishing mortality rate of F_{max}, which corresponds to an annual exploitation rate of 16.5%, and
2. The Council's surfclam quota setting policy, which is:

   OY = 1,850,000 - 3,400,000 bushels. Council policy is to set the quota within the OY range at a level that will allow fishing to continue at that level for at least 10 years. Within the above constraints, the quota is set at a level that will meet estimated annual demand.

Alternative overfishing definitions (Appendix 1) for ocean quahogs are:

1. A fishing mortality rate of $F_{20\%}$, which corresponds to an annual exploitation rate of 5.8%.
2. A fishing mortality rate of $F_{30\%}$, which corresponds to an annual exploitation rate of 3.5%.
3. A fishing mortality rate of F_{max}, which corresponds to an annual exploitation rate of 6.8%, and
4. The Council's ocean quahog quota setting policy, which is:

OY = 4,000,000 - 6,000,000 bushels. The Council policy is to set the quota within the OY range at a level that will allow fishing to continue at that level for at least 30 years. Within the above constraint, the quota is set at a level that will meet estimated annual demand.

The Council has had a 10 year supply horizon for surfclams and a 30 year supply horizon for ocean quahogs as its policy for annual quota setting for nearly a decade. This policy can remain intact for the annual quota setting and serves as what NMFS now calls a "target". The overfishing level is considered a "threshold" beyond which the long-term productive capability of the stock is jeopardized. The NMFS is encouraging the Council not to have the target and the threshold equal because the overfishing threshold, is intended to and, could become quite constraining if exceeded. Using this Amendment's adopted overfishing definition for both surfclams and ocean quahogs would not be constraining to the continued use of the 10 year clam horizon nor the 30 year ocean quahog horizon. The Council's quota setting process is more conservative than the rate-based overfishing levels, given the current resource conditions.

The Northeast Fisheries Science Center (NEFSC) developed an interactive spreadsheet model that can be used to evaluate the various proposed overfishing definitions considered. Two examples of the simulations that the Center developed are presented as Tables 2 (surfclams) and 4 (ocean quahogs). These two examples reflect current Council policy for each species and have the Council's adopted definition listed for comparison. The input parameters for these simulations are from the most recent surfclam and ocean quahog stock assessments from the 1995 SAW (USDC 1995b). The assumptions and the input parameters are listed for the spreadsheets in Tables 3 (surfclams) and 5 (ocean quahogs).

The surfclam example (Table 2) shows that with the assumptions made, the annual exploitation for all areas (column 9) would approach but would not exceed the adopted overfishing "threshold" ($F_{20\%}$ = 15.3% annual exploitation for all areas) during the Council's planning horizon. One of the critical assumptions for this model run is the fact that 30% of the currently unexploited biomass will be available for exploitation beginning in 1997. This is a reasonable assumption because the surfclam fishing industry is currently fishing on 60% of the resource in the Northern New Jersey and Delmarva areas. From the 1995 SAW (USDC 1995b), fully one-quarter of the total biomass for surfclams is on Georges Bank and the Council's assumption (during the annual quota setting process for year 1996) was that this proportion of the resource would not be available during the 10 year planning horizon. Thus, roughly two-thirds of the currently unfished biomass (40% of the total biomass is unfished) is on Georges Bank. This type of assumption has major harvest implications for the quota setting process which the Council can now explore with this simulation. Harvests for the next two years (1997 and 1998) would average near the current quota of 2.565 million bushels (19,776 mt). Graphic depictions of the clam exploitation rates (Figure 1) as well as harvest and stock size (Figure 2) are presented.

The non-preferred alternative overfishing reference points for surfclams are: 1) the Council's current policy and 2) F_{max}. The NMFS has drawn a significant difference between the definition of a "target" and a "threshold". The Council policy of a ten year supply horizon for surfclams can remain intact for the annual quota setting and serves as a "target", whereas the overfishing level is considered a "threshold" beyond which the long-term productive capability of the stock is jeopardized. It is good not to have the two levels equal, because the Council policy could become quite constraining if it were considered as the overfishing definition. The F_{max} level (given the current biocharacteristics) for surfclams is (average of Delmarva and Northern New Jersey areas) 0.18 corresponding to an annual exploitation rate of 16.2% (Table 1) which is slightly higher, and thus would be slightly less constraining than the $F_{20\%}$ level. The SSC did not recommend use of the F_{max} biological reference point because it is normally associated with growth overfishing while the 602 Guidelines focus on recruitment overfishing.

There is a "no action" alternative which is also non-preferred. NMFS has informed the Council that a new overfishing definition is necessary and that a 1997 quota will not be published unless there is a new definition.

The adopted overfishing definition for surfclams is the most conservative of the two biological reference point alternatives. The greater the amount of fishing allowed under an overfishing threshold the shorter the time horizon that the species supply will last. Thus, any short term gains (increase in harvest) will have significant long term impacts on the duration of the supply years. It has always been the Council policy to provide a fairly stable long term supply of surfclams.

The example for ocean quahogs (Table 4) reflects Council policy and has the critical assumption that fully all the biomass will be available for harvest during the 30 year planning horizon. Note that the Council policy sets the exploitation rate at 3.2% per year while the adopted overfishing threshold would be 4.3%. Harvests in the next few years would be similar to the 1996 quota of 4.45 million bushels (20,181 mt). Graphic depictions of the ocean quahog exploitation rates (Figure 3) as well as harvest and stock size (Figure 4) are presented.

The non-preferred alternative overfishing reference points for ocean quahogs are: 1) current Council policy, 2) F_{max}, 3) $F_{20\%}$, and 4) $F_{30\%}$. It is best to keep Council policy as a "target" rather than the overfishing "threshold" (see surfclams). Given the current known biology of ocean quahogs the instantaneous fishing mortality rates associated with the non-preferred alternatives would be: 0.068 (F_{max}), 0.058 ($F_{20\%}$), and 0.035 ($F_{30\%}$). The non-preferred instantaneous fishing rates just mentioned (Table 1) that are being considered for the threshold are all above the level of 3.2% exploitation for all areas that our 30 year planning horizon policy dictates. Thus, the continuation of the Council's 30 year supply horizon policy is more conservative than any of the non-preferred alternative overfishing definition options. Only the $F_{30\%}$ is more conservative of a threshold than the Council adopted definition. The SSC recommended the $F_{25\%}$.

Of course, there is a "no action" alternative which is also non-preferred for this Amendment. The NMFS has informed the Council that a new overfishing definition is necessary and that a 1997 quota will not be published unless a new definition is in place.

The adopted definition for ocean quahogs is the second most conservative of the four biological reference point alternatives considered. In all cases the greater the amount of fishing allowed under an overfishing threshold the shorter the time horizon that the species supply will last. Thus, any short term gains (increase in harvest) will have significant long term impacts on the duration of the supply years. It has always been the Council policy to provide a fairly stable long term supply of ocean quahogs.

9.2. ANALYSIS OF BENEFICIAL AND ADVERSE IMPACTS OF PROPOSED MANAGEMENT MEASURES

9.2.1. The FMP Relative to the National Standards

Section 301(a) of the MFCMA states: "Any fishery management plan prepared, and any regulation promulgated to implement such plan ... shall be consistent with the following national standards for fishery conservation and management." The following is a discussion of the standards and how this FMP meets them:

9.2.1.1. Conservation and management measures shall prevent overfishing while achieving, on a continuous basis, the optimum yield from each fishery for the United States fishing industry.

The Amendment does not change the MSYs, OYs, or quota setting process and, therefore, does not alter the FMP's consistency with this standard. Using the Council's adopted overfishing definition for both surfclams and ocean quahogs would not be constraining to the continued use of the 10 year surfclam horizon nor the 30 year ocean quahog horizon. The Council's policy (which will continue in place and serve as the annual target) for each species is more conservative than the adopted or non-preferred overfishing definitions (which will be the threshold level beyond which additional catches will result in the resource becoming overfished).

The Council has had a 10 year supply horizon for surf clams and a 30 year supply horizon for ocean quahogs as its policy for annual quota setting for nearly a decade. This policy can remain intact for the annual quota setting and serves as what is referred to as a "target". The overfishing level is considered a "threshold" beyond which the long-term productive capability of the stock is jeopardized. The NMFS is encouraging the Council not to have the target and the threshold equal because the overfishing threshold is intended to, and could become, quite constraining if exceeded. Using this Amendment's adopted overfishing definition for both surfclams and ocean quahogs would not be constraining to the continued use of the 10 year clam horizon nor the 30 year ocean quahog horizon. The Council's quota setting process is more conservative than the rate-based overfishing levels, given the current resource conditions.

Clarification of National Standard 1 is also provided in section 602.11 of the Guidelines published by NMFS which reads as follows:

"(b) General. The determination of OY is a decisional mechanism for resolving the Act's multiple purposes and policies, for implementing an FMP's objectives, and for balancing the various interests that comprise the national welfare. OY is based on MSY, or on MSY as it may be adjusted under paragraph (d)(3) of this section. The most important limitation on the specification of OY is that the choice of OY -- and the conservation and management measures proposed to achieve it -- must prevent overfishing.

"(c) Overfishing. (1) Overfishing is a level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis. Each FMP must specify, to the maximum extent possible, an objective and measurable definition of overfishing for each stock or stock complex covered by that FMP, and provide an analysis of how the definition was determined and how it relates to reproductive potential.

"(2) The definition of overfishing for a stock or stock complex may be developed or expressed in terms of a minimum level of spawning biomass ("threshold"); maximum level or rate of fishing mortality; or formula, model, or other measurable standard designed to ensure the maintenance of the stock's productive capacity. Overfishing must be defined in a way to enable the Council and the Secretary to monitor and evaluate the condition of the stock or stock complex relative to the definition.

"(3) Different fishing patterns can produce a variety of effects on local and areawide abundance, availability, size, and age composition of a stock. Some of these fishing patterns have been called "growth", "localized", or "pulse" overfishing; however, these patterns are not necessarily overfishing under the national standard 1 definition, which focuses on recruitment and long-term reproductive capacity."

The above description is the reason the SSC and the Council adopted the adopted overfishing definitions which deal with biological reference points related to recruitment overfishing, rather than reference points that would deal with yield-per-recruit (i.e. F_{max} or $F_{0.1}$) and thus growth overfishing.

9.2.1.2. Conservation and management measures shall be based upon the best scientific information available.

This FMP is based on the best and most recent scientific information available. Data used include NMFS logbook and permit files and the most recent stock assessments. The NEFSC has worked closely with the Council in the approaches considered for this Amendment and developed the interactive model for the evaluation of the various biological reference points and their associated impacts on the fishery.

9.2.1.3. To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

The Amendment does not affect this National Standard.

9.2.1.4. Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

The FMP does not discriminate among residents of different States. It does not differentiate among US citizens, nationals, resident aliens, or corporations on the basis of their State of residence. It does not incorporate or rely on a State statute or regulation that discriminates against residents of another State.

9.2.1.5. Conservation and management measures shall, where practicable, promote efficiency in the utilization of the fishery resources; except that no such measure shall have economic allocation as its sole purpose.

The management regime is intended to allow the fishery to operate at the lowest possible cost (e.g., fishing effort, administration, and enforcement) given the FMP's objectives. The FMP places no restrictions on the use of efficient techniques of harvesting, processing, or marketing. Since Amendment 9 does not alter the MSY, OY or quota setting process of the Council, it will have no affect on this National Standard.

9.2.1.6. Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

The Amendment does not alter the FMP's consistency with this National Standard. The historical catch basis for allocation takes into account and allows variations in catch. The annual quota setting process allows for adjustments to catch levels in response to the condition of the resources.

9.2.1.7. Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

This amendment does not affect this National Standard.

9.2.2. Cost/Benefit Analysis

The Council has had a 10 year supply horizon for surfclams and a 30 year horizon for ocean quahogs as its policy for annual quota setting for nearly a decade. This policy can remain intact for the annual quota setting and serves as what NMFS now calls a "target". The overfishing level is considered a "threshold" beyond which the long-term productive capability of the stock is jeopardized. The NMFS is encouraging the Council not to have the target and the threshold equal because the overfishing threshold could become quite constraining if exceeded. Using the Council's adopted overfishing definition for both surfclams and ocean quahogs would not be constraining for the continued use of the 10 year clam horizon nor the 30 year ocean quahog horizon. Thus, since the Council policy will remain in effect and is more conservation focused than are the adopted, or non-preferred, overfishing definitions, there is no change to the cost/benefits from the previous Amendments. The adopted overfishing definition for surfclams is the most conservative of the two biological reference point alternatives, while the adopted definition for ocean quahogs is the second most conservative of the four considered. In all cases the greater the amount of fishing allowed under an overfishing threshold the shorter the time horizon that the two species supply will last. Thus, any short term gains (increase in harvest) will have significant long term impacts on the duration of the supply years. It has always been the Council policy to provide a fairly stable long term supply of these resources.

9.2.3. Administrative Costs and Benefits

Since this Amendment only deals with clarification of the overfishing definitions for surfclams and ocean quahogs, there is no additional administrative costs or benefits.

9.2.4. Enforcement Costs

No additional enforcement costs or benefits will accrue from this Amendment.

9.2.5. Prices to Consumers

Retail prices to consumers are expected to remain stable under this Amendment.

9.2.6. Redistribution of Costs

The FMP is designed to give fishermen the greatest possible freedom of action in conducting business consistent with the FMP's objectives. It is not anticipated that the proposed management measures will redistribute costs between users or from one level of government to another.

9.3. RELATION OF RECOMMENDED MEASURES TO EXISTING APPLICABLE LAWS AND POLICIES

9.3.1. FMPs

Many fisheries of the northwest Atlantic result in significant non-target species fishing mortality. Therefore, each FMP must consider the impact of non-target species fishing mortality on other stocks and as a result of other fisheries. There is no significant bycatch of other species in either the surfclam or ocean quahog fisheries.

9.3.2. Treaties or International Agreements

No treaties or international agreements, other than GIFAs entered into pursuant to the MFCMA, relate to this fishery.

9.3.3. Federal Law and Policies

9.3.3.1. Marine mammals and endangered species

Numerous species of marine mammals and sea turtles occur in the northwest Atlantic Ocean. The most recent comprehensive survey in this region was done from 1979-1982 by the Cetacean and Turtle Assessment Program (CETAP), at the University of Rhode Island (University of Rhode Island 1982), under contract to the Minerals Management Service (MMS), Department of the Interior. The following is a summary of some of the information gathered in that study, which covered the area from Cape Sable, Nova Scotia, to Cape Hatteras, North Carolina, from the coastline to 5 nautical miles seaward of the 1,000 fathom isobath.

Four hundred and seventy one large whale sightings, 1547 small whale sightings and 1172 sea turtles were encountered in the surveys. The "estimated minimum population number" of each mammal and turtle, as well as those species in the area currently under the Endangered Species Act were also tabulated (Table 6).

The CETAP study concluded that both large and small cetaceans are widely distributed throughout the study area in all four seasons, and grouped the 13 most commonly seen species into three categories, based on geographical distribution. The first group contains only the harbor porpoise, which is distributed only over the shelf and throughout the Gulf of Maine, Cape Cod, and Georges Bank, but probably not southwest of Nantucket. The second group contains the most frequently encountered baleen whales (fin, humpback, minke, and right whales) and the white-sided dolphin. These are found in the same areas as the harbor porpoise, and also occasionally over the shelf at least to Cape Hatteras or out to the shelf edge. The third group "shows a strong tendency for association with the shelf edge" and includes the grampus, striped, spotted, saddleback, and bottlenose dolphins, and the sperm and pilot whales.

Loggerhead turtles were found throughout the study area, but appear to migrate north to about Massachusetts in summer and south in winter. Leatherbacks appear to have a more northerly distribution. The CETAP study hypothesized a northward migration in the Gulf Stream with a southward return in continental shelf waters nearer to shore. Both species usually were found over the shoreward half of the slope and in depths less than 200 feet. The study area may be important for sea turtle feeding or migrations, but the nesting areas for these species generally are in the South Atlantic and Gulf of Mexico.

Studies of sea turtles in Chesapeake Bay (Musick *et al.*, 1985) found that loggerhead and some ridley turtles spend the summer in Chesapeake Bay. Mortalities of sea turtles were studied, with pound net related causes accounting for about 19%, all other identifiable causes accounting for 11%; with the cause of death undetermined for the remaining 70%. The capture of turtles in pound nets apparently depends on the position of the net and the type of net.

The only endangered fish species occurring in the northwest Atlantic is the shortnose sturgeon (*Acipenser brevirostrum*). The Council urges fishermen to report any incidental catches of this species to the Regional Director, NMFS, One Blackburn Drive, Gloucester, MA 01930, who can forward the information to the active sturgeon data base.

The range of surfclams and ocean quahogs and the above marine mammals and endangered species overlap to a large degree, and there always exists some very limited potential for an incidental kill. Except in unique situations (e.g., tuna-porpoise in the central Pacific), such accidental catches should have a negligible impact on marine mammal/endangered species abundances, and the Council does not believe that implementation of this Amendment will have any adverse impact upon these populations. While marine mammals and endangered species may occur near surfclam and ocean quahog beds, it is highly unlikely any significant conflict between the fishermen managed by this Amendment and these species would occur. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. Additionally, surfclams and ocean quahogs are benthic organisms, while marine mammals and marine turtles are pelagic and spend nearly all of their time up in the water column or near the surface. The realized reduction in the number of fishing vessels resulting from the previous Amendment (Amendment 8) reduced the potential for the interaction with endangered species from a trivial to a very trivial level.

9.3.3.2. Marine sanctuaries

National marine sanctuaries are allowed to be established under the National Marine Sanctuaries Act of 1973. Currently there are 11 designated marine sanctuaries (Figure 5) that creates a system that protects over 14,000 square miles (National Marine Sanctuary Program 1993).

There are two designated national marine sanctuaries in the area covered by the FMP: the *Monitor* National Marine Sanctuary off North Carolina, and the Stellwagen Bank National Marine Sanctuary off Massachusetts. There are currently five additional proposed sanctuaries, but only one of the proposed five, the Norfolk Canyon, is on the east coast.

The *Monitor* National Marine Sanctuary was designated on 30 January 1975, under Title III of the Marine Protection, Research and Sanctuaries Act of 1972 (MPRSA). Implementing regulations (15 CFR 924) prohibit deploying any equipment in the Sanctuary, fishing activities which involve "anchoring in any manner, stopping, remaining, or drifting without power at any time" (924.3 (a)), and "trawling" (924.3 (h)). The Sanctuary is clearly designated on all National Ocean Service (NOS) charts by the caption "protected area." This minimizes the potential for damage to the Sanctuary by fishing operations. Correspondence for this sanctuary should be addressed to: *Monitor* NMS, NOAA, Building 1519, Fort Ousts, VA 23604.

The NOAA/NOS issued a proposed rule on 8 February 1991 (56 FR 5282) proposing designation under MPRSA of the Stellwagen Bank National Marine Sanctuary, in Federal waters between Cape Cod and Cape May, Massachusetts. On 4 November 1992, the Sanctuary was Congressionally designated. Implementing regulations (15 CFR 940) became effective March 1994. Commercial fishing is not specifically regulated by Stellwagen Bank regulations. The regulations do however call for consultation between Federal agencies and the Secretary of Commerce on proposed agency actions in the vicinity of the Sanctuary that "may affect" sanctuary resources. The process for consultation is currently being worked out between the Regional office of NMFS, the Sanctuary, and NEFMC. Correspondence for this sanctuary should be addressed to: Stellwagen Bank NMS, 14 Union Street, Plymouth, MA. 02360.

Details on sanctuary regulations may be obtained from the Chief, Sanctuaries and Reserves Division (SSMC4) Office of Ocean and Coastal Resource Management, NOAA, 1305 East-West Highway, Silver Spring, MD 20910.

9.3.3.3. Indian treaty fishing rights

No Indian treaty fishing rights are known to exist in the fishery.

9.3.3.4. Oil, gas, mineral, and deep water port development

Although Outer Continental Shelf (OCS) development plans may involve areas overlapping those contemplated for offshore fishery management, no major conflicts have been identified to date. The Council, through involvement in the Intergovernmental Planning Program of the MMS monitors OCS activities and has opportunity to comment and to advise MMS of the Council's activities. Certainly, the potential for conflict

exists if communication between interests is not maintained or appreciation of each other's efforts is lacking. Potential conflicts include, from a fishery management position: exclusion areas, adverse impacts to sensitive biologically important areas, oil contamination, substrate hazards to fishing gear, and competition for crews and harbor space. The Council is unaware of pending deep water port plans which would directly impact offshore fishery management goals in the areas under consideration, and is unaware of potential effects of offshore fishery management plans upon future development of deep water port facilities.

9.3.3.5. Impacts of the Amendment relative to the Paperwork Reduction Act and the Regulatory Flexibility Act

The Paperwork Reduction Act concerns the collection of information. The intent of the Act is to minimize the Federal paperwork burden for individuals, small businesses, and State and local governments, as well as to maximize the usefulness of information that is collected by the Federal government.

Current paperwork requirements under the FMP include the vessel permit application, recording of fishing activity in official logbooks, and reporting of processing and employment data by dealers receiving surfclams and ocean quahogs. All reporting requirements remain unchanged.

The Regulatory Flexibility Act (RFA) requires the examination of the impacts of Federal regulations on small businesses, small organizations, and small jurisdictions. Many business enterprises which harvest or process surfclams and ocean quahogs are considered small under the interpretation of this Act.

It is the intention of the Council that the changes in regulatory requirements under Amendment 8 reduced the burden on small businesses and increased the degree of flexibility operators have in managing their businesses. The combination of all surfclam fishing areas and the elimination of effort restrictions enabled vessel operators to decide for themselves when and where to fish. The loss of fishing time due to inclement weather was reduced since trips could be rescheduled without notification and approval by NMFS. Concerns about vessel safety and harvesting efficiency were addressed since the Mid-Atlantic Area moratorium was lifted and vessel replacement was no longer subject to interpretive rules on fishing power. Guaranteed ownership of harvest share facilitated business decisions on the allocation of effort among vessels and in inventory planning by processors. Overall, compliance with the RFA was greatly improved with the implementation of Amendment 8, but will not be at all affected by Amendment 9 since it does not change the permitting and reporting requirements of the FMP.

9.3.4. State, Local, and Other Applicable Law and Policies

9.3.4.1. State management activities

Current State surfclam minimum size limits are: Massachusetts, 5"; Rhode Island, 5.5"; New York, 4"; New Jersey, none; Maryland, 5.5"; and Virginia, 5.5".

9.3.4.2. State action necessary to implement measures within State waters to achieve FMP objectives, consequences of State inaction or contrary action, and recommendations

No explicit additional actions need to be taken by any State to make the program set forth in this Amendment succeed.

9.3.4.3. Impact of Federal regulations on State management activities

No explicit additional actions need to be taken by any State to make the program set forth in this Amendment succeed.

9.3.4.4. Coastal zone management program consistency

The CZM Act of 1972, as amended, provides measures for ensuring stability of productive fishery habitat while striving to balance development pressures with social, economic, cultural, and other impacts on the

coastal zone. It is recognized that responsible management of both coastal zones and fish stocks must involve mutually supportive goals.

The Council must determine whether the Amendment will affect a State's coastal zone. If it will, the Amendment must be evaluated relative to the State's approved CZM program to determine whether it is consistent to the maximum extent practicable. The States have 45 days in which to agree or disagree with the Council's evaluation. If a State fails to respond within 45 days, the State's agreement may be presumed. If a State disagrees, the issue may be resolved through negotiation or, if that fails, by the Secretary.

In order to comply with the CZM Act, Amendment 9 was reviewed relative to the approved CZM programs of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina. Letters have been sent to all of the States listed above stating that the Council concluded that the Amendment is consistent to the maximum extent practicable with the State's CZM program as understood by the Council.

9.4. COUNCIL REVIEW AND MONITORING OF THE FMP

The Council will monitor the fishery annually using the best available data. As a result of that monitoring, the Council will determine whether it is necessary to amend the FMP.

10. REFERENCES

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Table 1. Percentage of Stock (in numbers) Caught Annually (i.e. Exploitation Rates) for Different Biological Reference Points Considered as Threshold for Surfclam and Ocean Quahog Overfishing Definitions.

		Instantaneous Fishing Mortality	Exploitation Rate
Surfclam (m=0.05)			
$F_{20\%msp}$	=	0.17	15.3%
F_{max}	=	0.18	16.2%
Ocean Quahog (m=0.02)			
$F_{30\%msp}$	=	0.035	3.4%
$F_{25\%msp}$	=	0.044	4.3%
$F_{20\%msp}$	=	0.058	5.6%
F_{max}	=	0.068	6.6%

Table 2. Surfclam Supply Year Calculations Developed from NEFSC Projection Model.

10 Year Harvesting Horizon Policy (with option to harvest unexploited stock)

ASSUMPTIONS / INPUTS:

Biomass estimate for 1994: (from SARC 19)

Region	Biomass	
NNJ	78.8	thousand mt
DMV	22.9	
Total	101.7	

Commercial Catch Estimate from Exploited Area (units: mt):

Year	Catch (mt)	Source
1994	21,208	database
1995	19,779	1995 quota
1996	19,200	1996 quota

Natural Mortality Rate, M: 0.05

Portion of total biomass that is unexploited in 1994 : 40%

Conversion Fac: 17 lbs/bu

Policy: Harvest calculated for 10-yr horizon

	F_ref		Label
Overfishing Def:	0.17	=	F_20% MSP

Annual Recruitment: 11,471 mt, mean (1984-1992) annual recr. to exploited areas (initially)
7,647 mt, annual recruitment in unexploited areas (initially)

Want to open part of unexploit. stock for harvest?

Enter fraction of unexpl. biomass to make available (exploitable): 30%

Starting in Year (>=1997): 1997

SIMULATION:

	Year	Biomass (Expl), mt	Biomass (Unexpl), mt	Tot Biomass	Harvest from Expl. Area: mt	bushels	Exploitation Expl Areas	All Areas	Overfishing Ref. Pt. Inst. Rate (F_ref) = F_20% MSP	Exploit. Rate = (F_ref / Z) * (1-exp(-Z))
1	1995	87,476	71,768	159,246	19,779	2,565,014	22.6%	12.4%	0.17	15.3%
2	1996	75,309	75,542	150,851	19,200	2,489,927	25.5%	12.7%	0.17	15.3%
3	1997	88,023	55,392	143,416	19,920	2,583,305	22.6%	13.9%	0.17	15.3%
4	1998	77,876	57,783	135,659	19,210	2,491,268	24.7%	14.2%	0.17	15.3%
5	1999	68,896	60,057	128,955	18,583	2,409,879	27.0%	14.4%	0.17	15.3%
6	2000	60,955	62,220	123,175	18,027	2,337,855	29.6%	14.6%	0.17	15.3%
7	2001	53,928	64,278	118,206	17,536	2,274,134	32.5%	14.8%	0.17	15.3%
8	2002	47,711	66,235	113,946	17,101	2,217,759	35.8%	15.0%	0.17	15.3%
9	2003	42,211	68,096	110,307	16,717	2,167,883	39.6%	15.2%	0.17	15.3%
10	2004	37,345	69,867	107,212	16,376	2,123,757	43.9%	15.3%	0.17	15.3%
11	2005	33,039	71,552	104,591	16,075	2,084,718	48.7%	15.4%	0.17	15.3%
12	2006	29,231	73,154	102,385	15,809	2,050,180	54.1%	15.4%	0.17	15.3%
13	2007	25,861	74,679	100,539	15,573	2,019,623	60.2%	15.5%	0.17	15.3%
14	2008	22,879	76,129	99,008	15,365	1,992,589	67.2%	15.5%	0.17	15.3%
15	2009	20,242	77,508	97,750	15,181	1,968,672	75.0%	15.5%	0.17	15.3%
16	2010	17,906	78,820	96,726	15,017	1,947,511	83.9%	15.5%	0.17	15.3%
17	2011	15,844	80,068	95,912	14,873	1,928,791	93.9%	15.5%	0.17	15.3%
18	2012	14,017	81,255	95,272	14,745	1,912,228	105.2%	15.5%	0.17	15.3%
19	2013	12,401	82,384	94,785	14,632	1,897,575	118.0%	15.4%	0.17	15.3%
20	2014	10,972	83,458	94,430	14,532	1,884,611	132.5%	15.4%	0.17	15.3%
21	2015	9,707	84,480	94,187	14,444	1,873,141	148.8%	15.3%	0.17	15.3%
22	2016	8,588	85,452	94,040	14,366	1,862,994	167.3%	15.3%	0.17	15.3%
23	2017	7,596	86,376	93,974	14,296	1,854,017	188.2%	15.2%	0.17	15.3%
24	2018	6,722	87,256	93,978	14,235	1,846,074	211.8%	15.1%	0.17	15.3%
25	2019	5,947	88,092	94,039	14,181	1,839,048	238.5%	15.1%	0.17	15.3%
26	2020	5,261	88,888	94,149	14,133	1,832,831	268.6%	15.0%	0.17	15.3%
27	2021	4,655	89,645	94,300	14,091	1,827,331	302.7%	14.9%	0.17	15.3%
28	2022	4,118	90,365	94,483	14,053	1,822,465	341.2%	14.9%	0.17	15.3%
29	2023	3,643	91,050	94,693	14,020	1,818,160	384.8%	14.8%	0.17	15.3%
30	2024	3,223	91,701	94,925	13,991	1,814,351	434.0%	14.7%	0.17	15.3%

Table 3. Documentation and Notes for Users of NEFSC Projection Model.

Total Biomass = Exploited Biomass + Unexploited Biomass .

The biomass of the exploited and unexploited portions of biomass are additive. The exploited stock is impacted by harvesting whereas the unexploited stock is not. Both portions of the stock are affected by natural mortality and recruitment. The annual harvest is a variable (see next paragraph). Natural mortality is a constant, whose value is given above (see "ASSUMPTIONS"). The exploited and unexploited portions of the stock are increased by annual recruitment (assumed constant, i.e, unrelated to biomass). Recruitment was estimated empirically for the exploited area. The level of recruitment to the unexploited area is based on the recruitment to the exploited area, adjusted by a factor relating the biomass of the unexploited area to the biomass of the exploited area, in the starting year.

Estimation of annual harvest:
The annual harvest for 1994 was estimated from actual data. The annual harvests for 1995 and 1996 have been set equal to the annual quotas for those years.
For the years 1997 through 2024, the annual harvest is computed as the annual catch that could be taken from the exploited stock for 10 years, while recruitment and natur. mortal. are taking place, such that in year 11 the exploited stock is completely depleted. The stock does not actually run out after 10 years because the annual harvest is updated in each year of the simulation, based on the most recent year's biomass in the exploited region (i.e., the 10-yr calc. is made every year). Thus, the annual harvest always represents that which could be taken for an additional 10 years given the most recent exploitable biomass (B).
Calculation of annual harvest (C) is based on the catch equation :
$B\_1 = (B\_0 - C + R)*\exp(-M)$, where "_#" represents an annual time step.
The generalized form of the catch equation is :
$B\_t = B\_0*\exp(-Mt) + [\text{ summation from i to t:}] [(R - C)*\exp(-Mi)]$.
To get C(T), the annual harvest for year T with the 10-yr horizon, the above equation is assigned the following values: B_0 = current exploitable biomass at time T, t = 11 and $B\_11 = 0$, and then it is solved for annual harvest :
$C(T) = [$ Expl. Biomass(T) / (1 + exp(M) + exp(2M) + ... + exp(10M))] + (Ann. Recrt. to Expl. Area).

The above equation is affected in the following ways when some fraction of unexploited biomass is made exploitable in a certain year: Expl. Biomass(T) = biomass from the historically exploited area + additional biomass from the previously unexploited area. Recrt. to Expl. Area = recruitment from the historically exploited area + additional recruitment from the previously unexploited area. Recruitment to the unexploited area is decremented by the amount now added to the exploited area.

Using the program:
Certain cells in the "Assumptions / Inputs" section may be changed by the user. When these are changed, the rest of the spreadsheet will be updated automatically. "Assumptions / Inputs" that the user can change include: Biomass by region, Commercial catch from 1994-1996, M, Portion of biomass that is unexploited in 1994, fraction of the unexploited biomass to start exploiting in a particular year, F_ref and its label (e.g. F_20%MSP), and mean recruitment to the exploited areas.

Although the SNJ region constitutes a small portion of the stock (about 3%), the biomass and exploitation from that area are not treated.

The "10 year harvesting horizon" is fixed (can not be changed by the user without major mofications).

Depending on the geographical area, the overfishing reference rate (F_20%MSP) ranges from 0.16 to 0.18 . Values in this range are reasonable to examine.

Table 4. Ocean Quahog Supply Year Calculations Developed from NEFSC Projection Model.

30 Year Harvesting Horizon Policy (with option to harvest unexploited stock)

ASSUMPTIONS / INPUTS:

Biomass estimate for 1994: (from SARC 19)

Region	Biomass
NJ	141.1 thousand mt
DMV	80.4
LI	56.9
Total	278.4

Commercial Catch Estimate from Exploited Area (units: mt):

Year	Catch (mt)	Source
1994	19,944	database
1995	20,865	1995 quota
1996	20,185	1996 quota

Natural Mortality Rate, M: 0.00

Portion of total biomass that is unexploited in 1994 : 60%

Conversion Fac: 10 lbs/bu

Policy: Harvest calculated for 30-yr horizon

	F_ref		Label
Overfishing Def:	0.0437	=	F_25% MSP

Annual Recruitment: 0 mt, annual recr. to exploited areas (initially)
0 mt, annual recruitment in unexploited areas (initially)

Want to open part of unexploit. stock for harvest?

Enter fraction of unexpl. biomass to make available (exploitable): 100%

Starting in Year (>=1997): 1997

SIMULATION:

	Year	Biomass (Expl), mt	Biomass (Unexpl), mt	Tot Biomass	Harvest from Expl. Area: mt	bushels	Exploitation Expl Areas	All Areas	Overfishing Ref. Pt. Inst. Rate (F_ref) = F_25% MSP	Exploit. Rate = (F_ref / Z) * (1-exp(-Z))
1	1995	258,456	417,600	676,056	20,865	4,599,945	8.1%	3.1%	0.0437	4.3%
2	1996	237,591	417,600	655,191	20,185	4,450,031	8.5%	3.1%	0.0437	4.3%
3	1997	635,008	-	635,008	20,484	4,515,983	3.2%	3.2%	0.0437	4.3%
4	1998	614,522	-	614,522	19,823	4,370,287	3.2%	3.2%	0.0437	4.3%
5	1999	594,699	-	594,699	19,184	4,229,310	3.2%	3.2%	0.0437	4.3%
6	2000	575,515	-	575,515	18,565	4,092,881	3.2%	3.2%	0.0437	4.3%
7	2001	556,950	-	556,950	17,966	3,960,852	3.2%	3.2%	0.0437	4.3%
8	2002	538,984	-	538,984	17,387	3,833,083	3.2%	3.2%	0.0437	4.3%
9	2003	521,597	-	521,597	16,826	3,709,435	3.2%	3.2%	0.0437	4.3%
10	2004	504,771	-	504,771	16,283	3,589,776	3.2%	3.2%	0.0437	4.3%
11	2005	488,488	-	488,488	15,758	3,473,977	3.2%	3.2%	0.0437	4.3%
12	2006	472,731	-	472,731	15,249	3,361,913	3.2%	3.2%	0.0437	4.3%
13	2007	457,481	-	457,481	14,757	3,253,464	3.2%	3.2%	0.0437	4.3%
14	2008	442,724	-	442,724	14,281	3,148,514	3.2%	3.2%	0.0437	4.3%
15	2009	428,443	-	428,443	13,821	3,046,949	3.2%	3.2%	0.0437	4.3%
16	2010	414,622	-	414,622	13,375	2,948,660	3.2%	3.2%	0.0437	4.3%
17	2011	401,247	-	401,247	12,943	2,853,542	3.2%	3.2%	0.0437	4.3%
18	2012	388,303	-	388,303	12,526	2,761,492	3.2%	3.2%	0.0437	4.3%
19	2013	375,778	-	375,778	12,122	2,672,412	3.2%	3.2%	0.0437	4.3%
20	2014	363,656	-	363,656	11,731	2,586,205	3.2%	3.2%	0.0437	4.3%
21	2015	351,925	-	351,925	11,352	2,502,779	3.2%	3.2%	0.0437	4.3%
22	2016	340,572	-	340,572	10,986	2,422,044	3.2%	3.2%	0.0437	4.3%
23	2017	329,586	-	329,586	10,632	2,343,914	3.2%	3.2%	0.0437	4.3%
24	2018	318,954	-	318,954	10,289	2,268,304	3.2%	3.2%	0.0437	4.3%
25	2019	308,666	-	308,666	9,957	2,195,132	3.2%	3.2%	0.0437	4.3%
26	2020	298,709	-	298,709	9,636	2,124,322	3.2%	3.2%	0.0437	4.3%
27	2021	289,073	-	289,073	9,325	2,055,795	3.2%	3.2%	0.0437	4.3%
28	2022	279,748	-	279,748	9,024	1,989,479	3.2%	3.2%	0.0437	4.3%
29	2023	270,724	-	270,724	8,733	1,925,302	3.2%	3.2%	0.0437	4.3%
30	2024	261,991	-	261,991	8,451	1,863,196	3.2%	3.2%	0.0437	4.3%

Table 5. Documentation and Notes for Users of NEFSC Projection Model.

Total Biomass = Exploited Biomass + Unexploited Biomass .

The biomass of the exploited and unexploited portions of biomass are additive. The exploited stock is impacted by harvesting whereas the unexploited stock is not. Both portions of the stock are affected by natural mortality and recruitment. The annual harvest is a variable (see next paragraph). Natural mortality is a constant, whose value is given above (see "ASSUMPTIONS"). The exploited and unexploited portions of the stock are increased by annual recruitment (assumed constant, i.e, unrelated to biomass). Based on the slow growth rate of adult ocean quahogs and the lack of small clams in the population size structure, annual recruitment from the pre-recruit to the recruit stage was set at 0. The level of recruitment to the unexploited area is based on the recruitment to the exploited area, adjusted by a factor relating the biomass of the unexploited area to the biomass of the exploited area, in the starting year.

Estimation of annual harvest:
The annual harvest for 1994 was estimated from actual data. The annual harvests for 1995 and 1996 have been set equal to the annual quotas for those years.
For the years 1997 through 2024, the annual harvest is computed as the annual catch that could be taken from the exploited stock for 30 years, while recruitment and natur. mortal. are taking place, such that in year 31 the exploited stock is completely depleted. The stock does not actually run out after 30 years because the annual harvest is updated in each year of the simulation, based on the most recent year's biomass in the exploited region (i.e., the 30-yr calc. is made every year). Thus, the annual harvest always represents that which could be taken for an additional 30 years given the most recent exploitable biomass (B).
Calculation of annual harvest (C) is based on the catch equation :
B_1 = (B_0 - C + R)*exp(-M), where "_#" represents an annual time step.
The generalized form of the catch equation is :
B_t = B_0*exp(-Mt) + [summation from i to t:] [(R - C)*exp(-Mi)].
To get C(T), the annual harvest for year T with the 30-yr horizon, the above equation is assigned the following values: B_0 = current exploitable biomass at time T, t = 31 and B_31 = 0, and then it is solved for annual harvest :
C(T) = [Expl. Biomass(T) / (1 + exp(M) + exp(2M) + ... + exp(30M))] + (Ann. Recrt. to Expl. Area).

The above equation is affected in the following ways when some fraction of unexploited biomass is made exploitable in a certain year: Expl. Biomass(T) = biomass from the historically exploited area + additional biomass from the previously unexploited area. Recrt. to Expl. Area = recruitment from the historically exploited area + additional recruitment from the previously unexploited area. Recruitment to the unexploited area is decremented by the amount now added to the exploited area.

Using the program:
Certain cells in the "Assumptions / Inputs" section may be changed by the user. When these are changed, the rest of the spreadsheet will be updated automatically. "Assumptions / Inputs" that the user can change include: Biomass by region, Commercial catch from 1994-1996, M, Portion of biomass that is unexploited in 1994, fraction of the unexploited biomass to start exploiting in a particular year, F_ref and its label (e.g., F_25%MSP), and mean recruitment to the exploited areas.

Although the SNJ region constitutes a small portion of the stock (about 3%), the biomass and exploitation from that area are not treated.

The "30 year harvesting horizon" is fixed (can not be changed by the user without major mofications).

For the LI area, the overfishing reference rate (F_25%MSP) = 0.0437 .

Table 6. Cetaceans and Turtles found in Survey Area.

Scientific name	Common name	Est. Minimum Number in Study Area	Endangered	Threatened
LARGE WHALES				
Balaenoptera physalus	fin whale	1,102	X	
Megaptera novaeangliae	humpback whale	684	X	
Balaenoptera acutorostrata	minke whale	162		
Physeter catodon	sperm whale	300	X	
Eubalaena glacialis	right whale	29	X	
Balaenoptera borealis	sei whale	109	X	
Orcinus orca	killer whale	unk		
SMALL WHALES				
Tursiops truncatus	bottlenose dolphin	6,254		
Globicephala spp.	pilot whales	11,448		
Lagenorhynchus acutus	Atl. white-sided dolphin	24,287		
Phocoena	harbor porpoise	2,946		
Grampus griseus	grampus (Risso's) dolphin	10,220		
Delphinus delphis	saddleback dolphin	17,606		
Stenella spp.	spotted dolphin	22,376		
Stenella coeruleoalba	striped dolphin	unk		
Lagenorhynchus albirostris	white-beaked dolphin	unk		
Ziphius cavirostris	Cuvier's beaked dolphin	unk		
Stenella longirostris	spinner dolphin	unk		
Steno bredanensis	rough-toothed dolphin	unk		
Delphinapteras leucas	beluga	unk		
Mesoplodon spp.	beaked whales	unk		
TURTLES				
Caretta caretta	loggerhead turtle	4,017		X
Dermochelys coriacea	leatherback turtle	636	X	
Lepidochelys kempi	Kemp's ridley turtle	unk	X	
Chelonia mydas	green turtle	unk		X

Source: University of Rhode Island 1982.

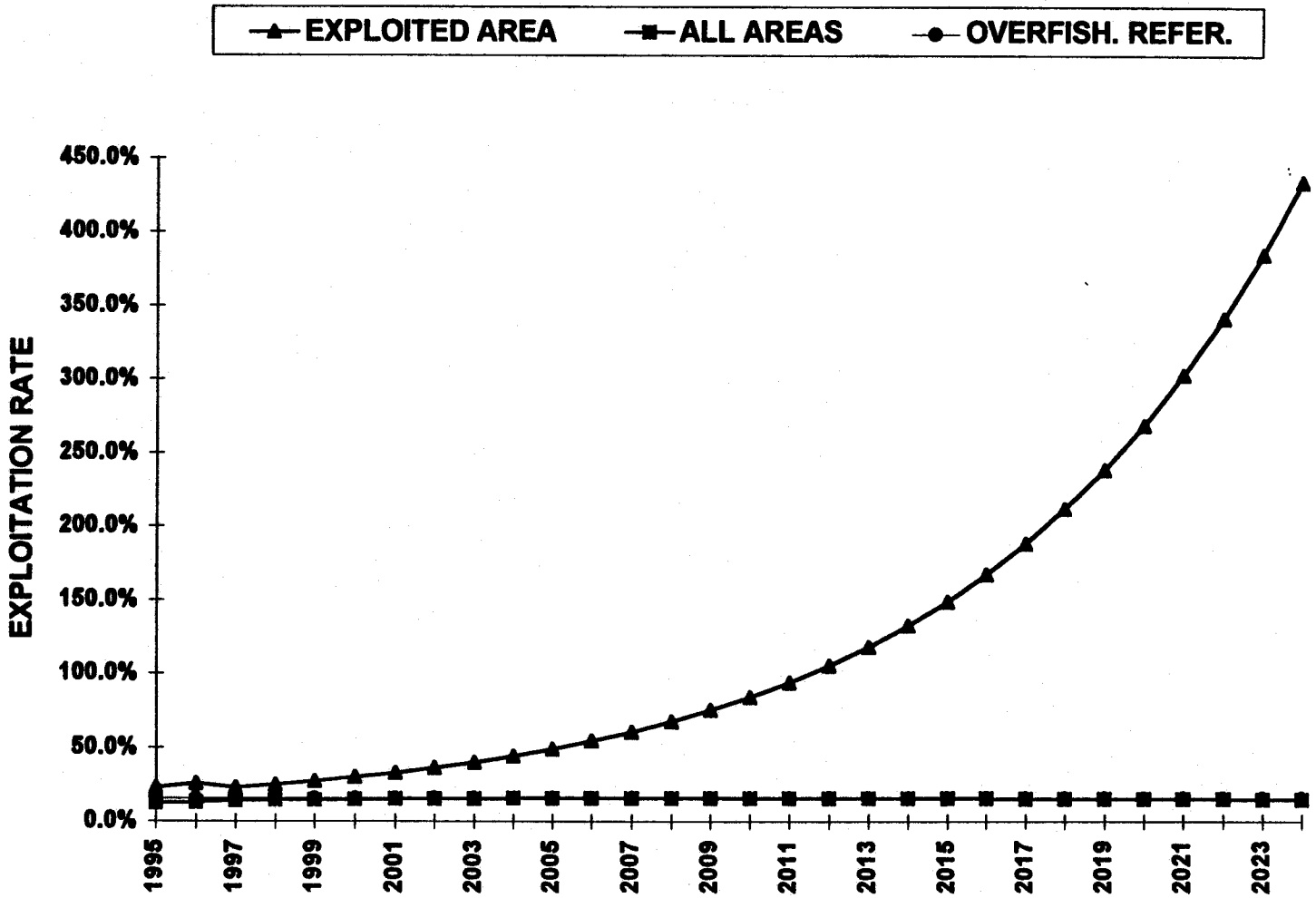

Figure 1. Surfclam exploitation rate over time (yrs).

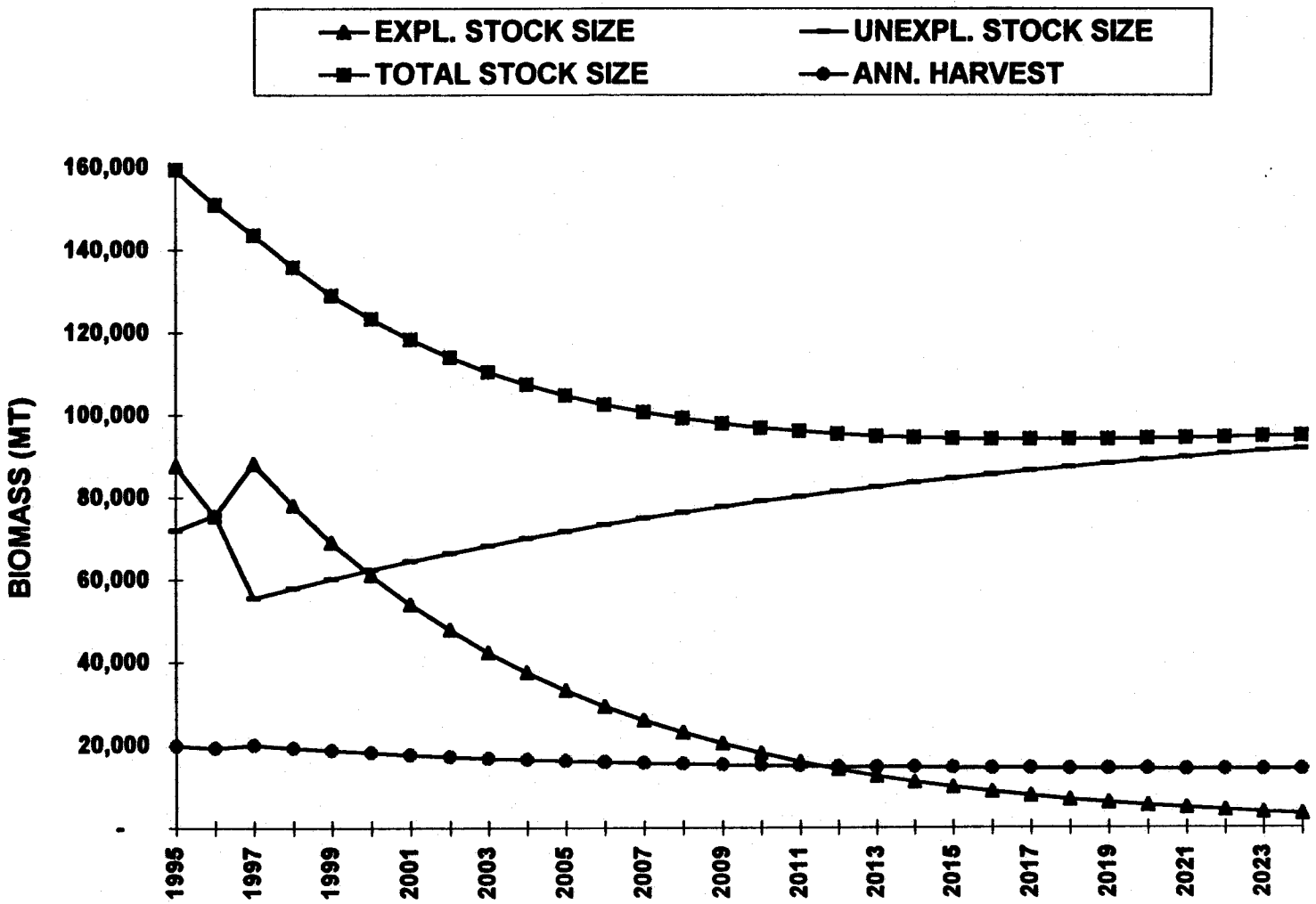

Figure 2. Surfclam harvest and stock size over time (yrs).

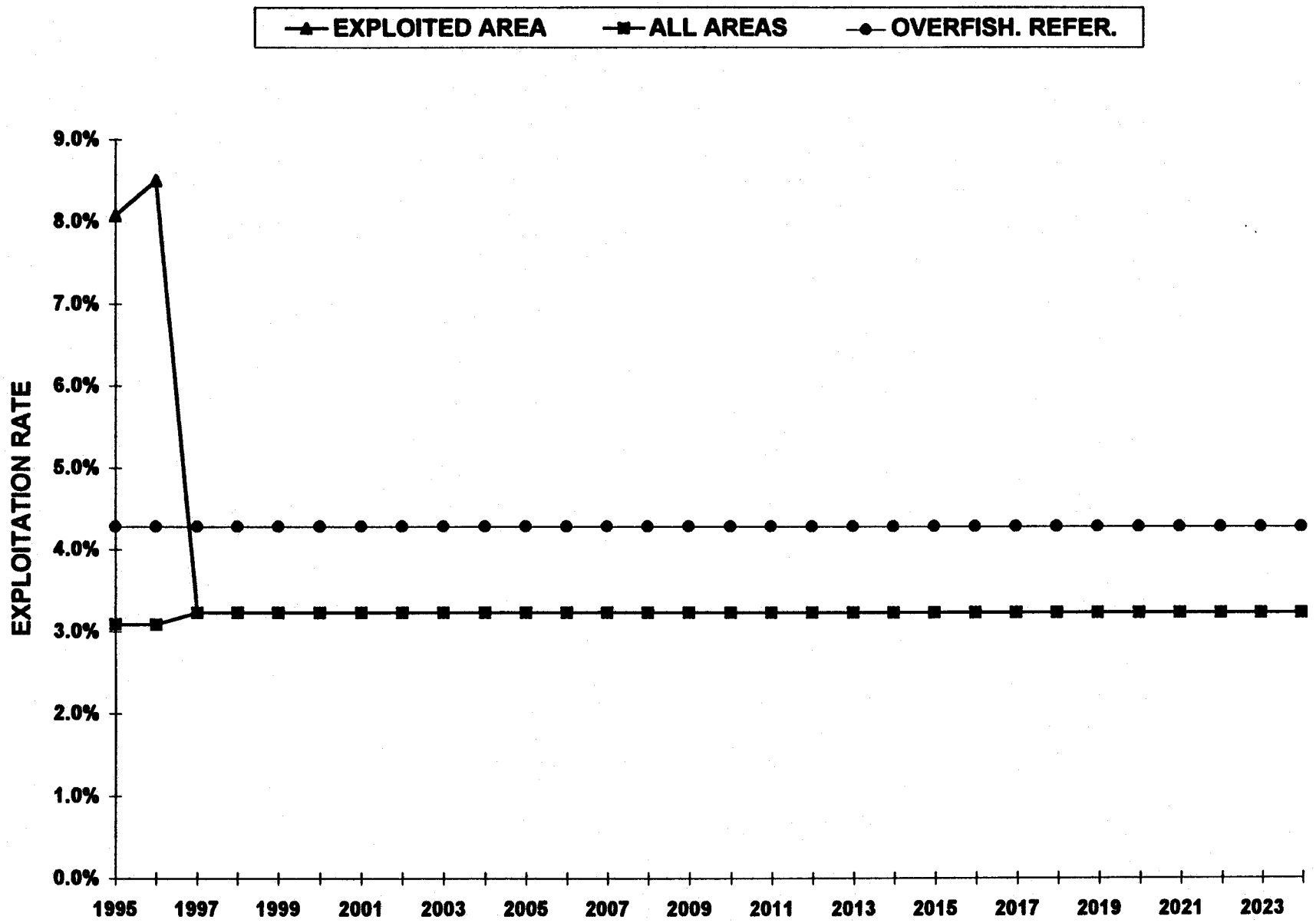

Figure 3. Ocean quahog exploitation rate over time (yrs).

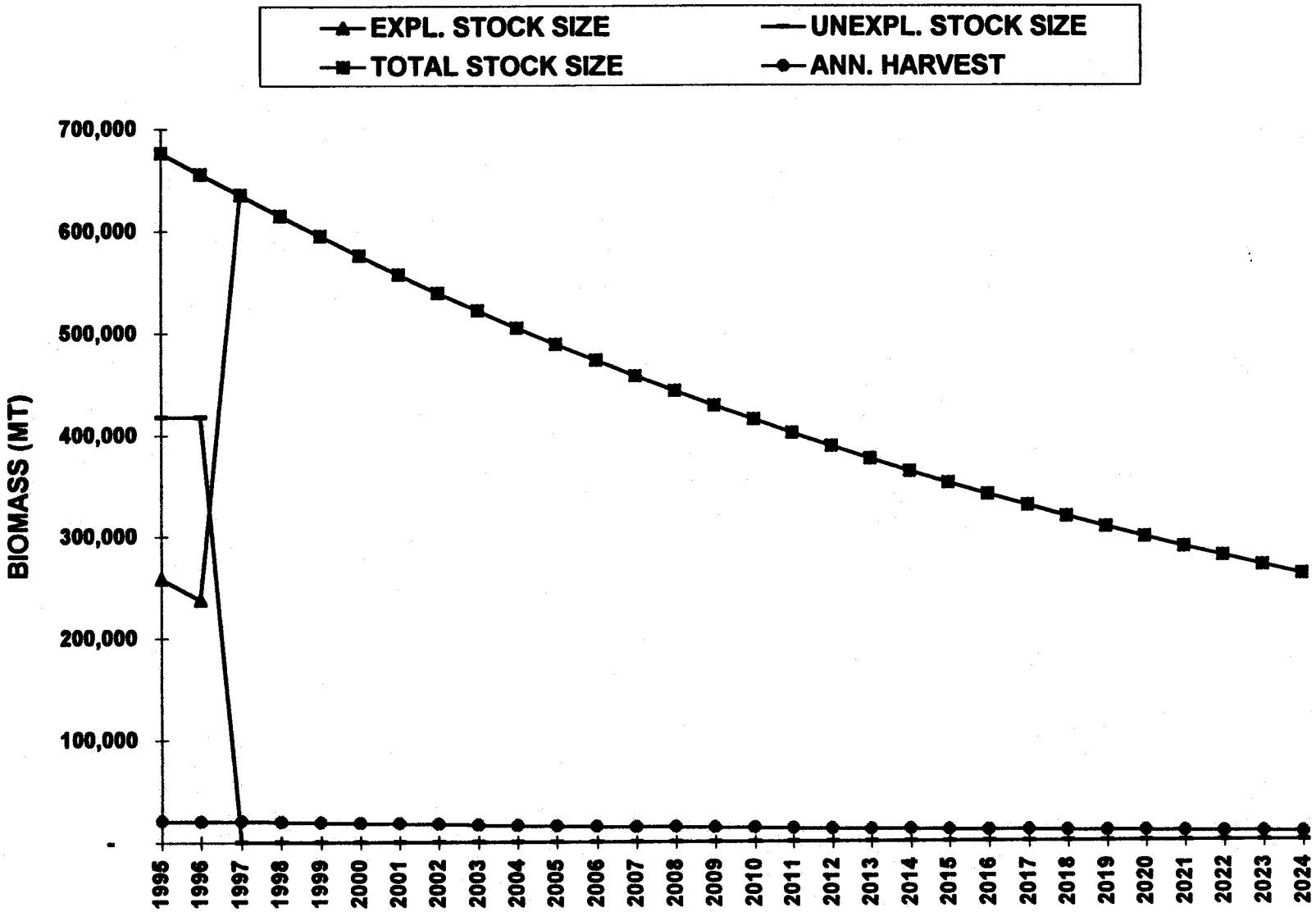

Figure 4. Ocean quahog harvest and stock size over time (yrs).

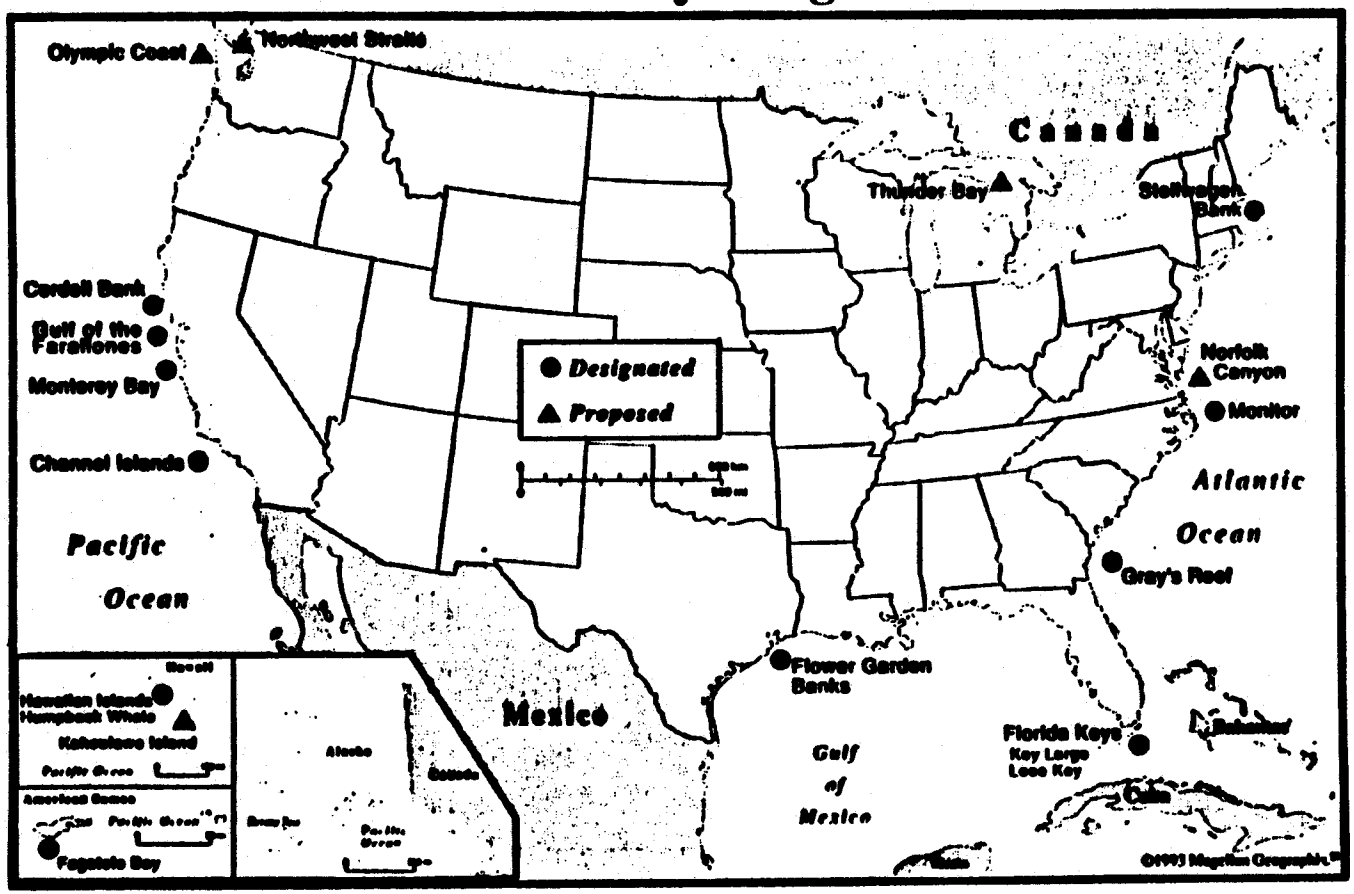

Figure 5. Designated and Proposed National Marine Sanctuaries.

Source: National Marine Sanctuary Program 1993.

APPENDIX 1. REGULATORY IMPACT REVIEW

1. INTRODUCTION

1.1. Purpose

Executive Order 12866, "Regulatory Planning and Review", was signed on September 30, 1993, and established guidelines for promulgating new regulations and reviewing existing regulations. While the executive order covers a variety of regulatory policy considerations, the benefits and costs of regulatory actions are a prominent concern. Section 1 of the order deals with the regulatory philosophy and principles that are to guide agency development of regulations. The regulatory philosophy stresses that, in deciding whether and how to regulate, agencies should assess all costs and benefits of all regulatory alternatives. In choosing among regulatory approaches, the philosophy is to choose those approaches that maximize net benefits to society.

The regulatory principles in E.O. 12866 emphasize careful identification of the problem to be addressed. The agency is to identify and assess alternatives to direct regulation, including economic incentives, such as user fees or marketable permits, to encourage the desired behavior. When an agency determines that a regulation is the best available method of achieving the regulatory objective, it shall design its regulations in the most cost-effective manner to achieve the regulatory objective. Each agency shall assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Each agency shall base its decisions on the best reasonably obtainable scientific, technical, economic, and other information concerning the need for, and consequences of, the intended regulation.

The National Marine Fisheries Service (NMFS) requires the preparation of a Regulatory Impact Review (RIR) for all regulatory actions that either implement a new Fishery Management Plan (FMP) or significantly amend an existing plan. The RIR is part of the process of preparing and reviewing FMPs and provides a comprehensive review of the changes in net economic benefits to society associated with proposed regulatory actions. The analysis also provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problems. The purpose of the analysis is to ensure that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way. The RIR addresses many of the items in the regulatory philosophy and principles of E.O. 12866.

Executive Order 12866 requires that the Office of Management and Budget review proposed regulatory programs that are considered to be "significant." A "significant regulatory action" is one that is likely to:

> (1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
>
> (2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
>
> (3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
>
> (4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

A regulatory program is "economically significant" if it is likely to result in the effects described in item (1) above.

The RIR is designed to provide information to determine whether the proposed regulation is likely to be "economically significant."

The document also contains an analysis of the impacts of the Plan relative to the Regulatory Flexibility Act and the Paperwork Reduction Act of 1980.

1.2. Description of User Groups

The fishery is described in Sections 7 and 8 of Amendment 8.

1.3. Problems Addressed by Amendment 7

The problems to be addressed are discussed in Section 4.2 of Amendment 9.

1.4. Management Objectives

The objectives of the FMP are:

1. Conserve and rebuild Atlantic surfclam and ocean quahog resources by stabilizing annual harvest rates throughout the management unit in a way that minimizes short term economic dislocations.

2. Simplify to the maximum extent the regulatory requirement of surfclam and ocean quahog management to minimize the government and private cost of administering and complying with regulatory, reporting, enforcement, and research requirements of surfclam and ocean quahog management.

3. Provide the opportunity for industry to operate efficiently, consistent with the conservation of surfclam and ocean quahog resources, which will bring harvesting capacity in balance with processing and biological capacity and allow industry participants to achieve economic efficiency including efficient utilization of capital resources by the industry.

4. Provide a management regime and regulatory framework which is flexible and adaptive to unanticipated short term events or circumstances and consistent with overall plan objectives and long term industry planning and investment needs.

1.5. Provisions of Amendment 9

The impacts of options are presented in Section 9.1 of Amendment 9.

2. REGULATORY IMPACT ANALYSIS

The impacts of options are presented in Section 9.2 of Amendment 9.

3. DISCUSSION OF THE BENEFITS AND COSTS OF THE AMENDMENT

E.O. 12866 requires that a benefit-cost analysis of all proposed regulations be performed.

3.1 Costs

There are no additional management costs associated with any of the alternatives since the Council quota setting policy is more conservation oriented than any of the threshold overfishing levels (section 9.2 of Amendment 9).

3.2. Benefits

The benefits of this Amendment are the codification that overfishing will not be allowed to occur in the future should the Council change their annual quota setting policy (section 9.2 of Amendment 9).

3.3. Benefit - Cost Conclusion

Benefits and costs are discussed in section 9.2 of Amendment 9.

4. OTHER E.O. 12866 REQUIREMENTS

The FMP should not have an annual effect of $100 million or more. The exvessel value of surfclam and ocean quahog landings in 1994 were $ 42 million and $19 million respectively. Total exvessel values have remained fairly constant as the landings of the two species have averaged 71 million pounds and 50 million pounds respectively from 1989 through 1993. (USDC 1995c). There are no recreational fisheries for either of these species. While the two resources have been fully fished for nearly the last two decades, the purpose of this Amendment is to codify the prevention of future overfishing, and thus continued stable catches in the future.

The FMP will not lead to an increase in costs or prices to consumers (section 9.2.2.4 of Amendment 9).

Cost and benefit data are presented and analyzed in section 9.2.2 of Amendment 9.

The FMP will not have significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of US based enterprises to compete with foreign based enterprises in domestic or export markets.

MAJOR RULE DETERMINATION

The analysis described above shows that if the evaluated management measures were to be enacted, they would not constitute a "major rule" under the criteria described in E.O. 12866.

5. IMPACTS OF THE PLAN RELATIVE TO THE REGULATORY FLEXIBILITY ACT

5.1. Regulatory Flexibility Analysis

5.1.1. Introduction

The purpose of the Regulatory Flexibility Act (RFA) is to minimize the adverse impacts from burdensome regulations and record keeping requirements on small businesses, small organizations, and small government entities. There will be no additional regulations or recordkeeping requirements because of this Amendment. The impacts of the proposed action on the fishing industry and the economy as a whole were discussed in section 9.2 of the Amendment. The following discussion of impacts centers specifically on the effects of the proposed action on the mentioned small businesses entities.

5.1.2. Determination of significant economic impact on a substantial number of small entities

According to guidelines on regulatory analysis of fishery management actions, a "substantial number" of small entries is more than 20 percent of those small entries engaged in the fishery (NMFS 1994). The Small Business Administration (SBA) defines a small business in the commercial fishing activity as a firm with receipts of up to $2.0 million annually. The majority of the vessels in the surfclam and ocean quahog fishery may readily qualify as small entities according to the SBA criteria. However the proposed action will not affect these vessels, and thus the "substantial number" criteria is irrelevant.

Economic impacts on small business entities are considered to be "significant" if the proposed action would result in any of the following: a) a reduction in annual gross revenues by more than 5 percent; b) an increase in total costs of production by more than 5 percent as a result of an increase in compliance costs; c) an increase in compliance costs as a percent of sales for small entities at least 10 percent higher than compliance costs as a percent of sales for large entities; d) capital costs of compliance represent a significant portion of capital available to small entities, considering internal cash flow and external financing capabilities; or, e) as a "rule of thumb," 2 percent of small businesses entities being forced to cease business operations (NMFS 1994).

5.1.2.1. Options (Management measures)

The options or management measures evaluated are described in section 9.2.2 of Amendment 9.

The Council annual quota setting policy is more conservative than any of the proposed biological reference points considered for the overfishing threshold. The Council policy will serve as the annual target harvest level. This option provides the best balance between yield to the fishery and risk to the stock. This option provides the industry with the least drastic changes in the quota from one year to the next (drastic fluctuations in landings can affect cost of production, prices and market stability). This option is expected to allow the stock to continue to be fully utilized without threat of closing the fishery or affecting the economy or social structure of the participants in a detrimental manner.

Since the adopted alternative for this Amendment maintains the status quo fishing mortality strategy, no significant impacts will occur on small business entities.

5.1.2.2. Conclusions

The preceding Regulatory Flexibility Analysis indicate that the proposed regulation in this Amendment would have no adverse effect on small business entities.

6. PAPERWORK REDUCTION ACT OF 1980

The Paperwork Reduction Act concerns the collection of information. The intent of the Act is to minimize the Federal paperwork burden for individuals, small business, State and local governments, and other persons as well as to maximize the usefulness of information collected by the Federal government. Amendment 9 will not change the paperwork burden of the FMP.

7. IMPACTS OF THE PLAN RELATIVE TO FEDERALISM

The FMP does not contain policies with federalism implications sufficient to warrant preparation of a federalism assessment under Executive Order 12612.

APPENDIX 2. ENVIRONMENTAL ASSESSMENT

1. INTRODUCTION

The Mid-Atlantic Fishery Management Council (Council) has been involved in surfclam and ocean quahog management since its first meeting (September 1976), when it was discussed that the surfclam fishery should be the first for which a plan should be developed. At the February 1977 meeting the Council voted to accept responsibility for the surfclam plan and began discussion of possible management measures. From April through August 1977 every meeting included a debate over possible management measures. Public hearings were conducted during June 1977, with major revisions proposed to the management system based on public comments. The original FMP (MAFMC 1977) was approved in November 1977 for the period through September 1979. It contained specific quarterly quotas for surfclams (350,000 bushels (bu) each for October-December and January-March and 550,000 bu each for April-June and July-September) and an annual quota (3,000,000 bu) for ocean quahogs. The effort limitation, permit, and logbook provisions were included. The FMP (MAFMC 1977) also instituted a moratorium in the surfclam fishery (all surfclams, since there was no New England Area) for one year to allow time for the development of an alternative limited entry system "such as a stock certificate program".

Amendment 1 (MAFMC 1979a) extended the FMP for ninety days, until the end of 1979 (primarily to allow for completion of the latest stock assessment). It added processor reporting requirements and removed the requirement that each quarter begin with four days of fishing (even though the stock was depressed, the excess harvesting capacity led to closures very quickly). The moratorium was continued.

Amendment 2 (MAFMC 1979b) extended the FMP through the end of 1981 and divided the surfclam portion of the management unit into the New England and Mid-Atlantic Areas. Annual quotas were: 25,000 bu of surfclams for the New England Area, 1.8 million bu of surfclams for the Mid-Atlantic Area, 3.5 million bu of quahogs for 1980, and 4 million bu of quahogs for 1981. The quarterly quotas in the Mid-Atlantic Area were: moving closer to equal (400,000 bu for the fall and winter quarters and 500,000 bu for the spring and summer quarters. The bad weather make up day was introduced. The moratorium was continued in the Mid-Atlantic Area.

Amendment 3 (MAFMC 1981), approved 13 November 1981, extended the FMP indefinitely. A 5.5" surfclam minimum size limit was imposed in the Mid-Atlantic Area. The surfclam fishing week in the Mid-Atlantic Area was expanded to Sunday-Thursday from Monday-Thursday. Quota setting was put on a framework basis with ranges of: 1.8-2.9 million bu for Mid-Atlantic Area surfclams, 25,000-100,000 bu for New England Area surf clams, and 4-6 million bu for ocean quahogs. The Council proposed a permit limitation system to replace the moratorium which was disapproved by NMFS. The NMFS extended the moratorium.

Amendment 4 was initiated in response to a closure of the New England Area to surfclam fishing during the second half of 1983. The provisions of Amendment 4 were implemented on an emergency basis for 180 days beginning 1 July 1984, during which time the Amendment was finalized by the New England Council and submitted for Secretarial approval. However, it was determined that the document was not structurally complete for review.

Amendment 5 (MAFMC 1984), approved 28 February 1985, allowed for revision of the surfclam minimum size limit provisions, extended the size limit throughout the entire fishery, and instituted a requirement that cages be tagged.

Amendment 6 (MAFMC 1986) was begun in October 1984 following an exploratory fishery conducted on Georges Bank as a result of emergency regulations published 2 August 1984 (49 *FR* 30946- 30948), primarily to address problems associated with the development of a surfclam fishery on Georges Bank. Given the relationship between the provisions of Amendments 4 and 6, the decision was made to abandon Amendment 4 and the Mid-Atlantic Council would combine the provisions of Amendment 4 with the Mid-Atlantic Council's Amendment 6 in one document. The combination of Amendments 4 and 6 did not change any substantive provisions of either Amendment. The Amendment was approved on 9 April 1986 when the 60-day review period expired without action by NMFS.

Amendment 7 (MAFMC 1987) was developed to change the quota distribution on Georges Bank (from 20:40:40:20 to equal quarterly quotas) and revise the roll over provisions from one period to the next. This amendment was taken to public hearings in February 1987, approved by NMFS, and final regulations published on 24 July 1987.

Amendment 8 (MAFMC 1988) established an individual transferable quota (ITQ) system primarily to replace the regulated fishing time system in place in the Mid-Atlantic surfclam fishery. This fishery was operating under a moratorium on vessel permits. Allowable fishing time in this fishery went from 96 hours a week in 1978 to six 6 hour trips per quarter in 1988. The ITQ system essentially converted allowable fishing time into allowable individual levels of harvest. The Council had several alternatives under consideration during the development of Amendment 8 with respect to management of the New England surfclam fishery and the ocean quahog fishery. These fisheries were controlled through quotas prior to Amendment 8. The ocean quahog quota had never been fully harvested. Many felt that the Council should simply impose a moratorium on this fishery until such time as restraints on harvest were necessary. When such restraints were necessary, an ITQ system could have been imposed based on reported landings. The Council decided to bring the ocean quahog fishery under the ITQ system because it believed that the problems experienced in the surfclam fishery under the moratorium would simply be relived under a quahog moratorium. The vessel owners that received allocation under the ITQ system were those whose vessels had reported landings under the mandatory logbook requirement that had been in place since 1978.

This Amendment is intended to bring the Fishery Management Plan for the Atlantic Surfclam and Ocean Quahog Fisheries (FMP) into compliance with the guidelines in 50 CFR 602 which mandate a quantifiable definition of overfishing in all FMPs. The FMP modified by this Amendment was implemented on 17 November 1977. The Amendment does not change the MSYs, OYs, or quota setting process and, therefore, does not alter the FMP's consistency with any National Standard. National Standard 1 is the only standard affected by the redefinition of overfishing produced through this Amendment and since the Council's time-horizon, quota-setting policy is more conservative than the adopted rate-based alternative overfishing definition, conservation and management measures for these resources will continue to prevent overfishing. The Council's quota setting policy will remain the annual "target" harvest level, while the new rate based overfishing level will be the "threshold" of harvest levels beyond which the long-term productive capability of the stock is jeopardized.

2. PURPOSE OF AND NEED FOR ACTION

The problem to be addressed in Amendment 9 is set forth in section 4.2 of the Amendment.

3. MANAGEMENT OBJECTIVES

The objectives of the FMP are:

1. Conserve and rebuild Atlantic surfclam and ocean quahog resources by stabilizing annual harvest rates throughout the management unit in a way that minimizes short term economic dislocations.

2. Simplify to the maximum extent the regulatory requirement of surfclam and ocean quahog management to minimize the government and private cost of administering and complying with regulatory, reporting, enforcement, and research requirements of surfclam and ocean quahog management.

3. Provide the opportunity for industry to operate efficiently, consistent with the conservation of surfclam and ocean quahog resources, which will bring harvesting capacity in balance with processing and biological capacity and allow industry participants to achieve economic efficiency including efficient utilization of capital resources by the industry.

4. Provide a management regime and regulatory framework which is flexible and adaptive to unanticipated short term events or circumstances and consistent with overall plan objectives and long term industry planning and investment needs.

4. MANAGEMENT UNIT

The management unit is all surfclams (*Spisula solidissima*) and all ocean quahogs (*Arctica islandica*) in the Atlantic EEZ.

5. ALTERNATIVES

The options considered by the Council for Amendment 9 are presented in section 9.1 and evaluated in section 9.2 of the Amendment.

6. ENVIRONMENTAL IMPACTS

There are no environmental affects of bringing this FMP into compliance with the guidelines in 50 CFR 602. This Amendment does not change the MSYs, OYs or quota setting processes. The Council quota setting policy is more conservative than the proposed overfishing threshold and as such will remain the annual target harvest level. The impacts of options are presented in Section 9.2 of Amendment.

7. MANAGEMENT COSTS

There will be no new management costs associated with this Amendment since the conservative quota setting Council policy will remain in effect as the annual target harvest level. The impacts of options are presented in Section 9.2 of Amendment.

8. TRADEOFFS BETWEEN THE BENEFICIAL AND ADVERSE IMPACTS OF THE AMENDMENT

The impacts of options are presented in Section 9.2 of Amendment.

9. EFFECT ON ENDANGERED SPECIES AND ON THE COASTAL ZONE

The relationships among this Amendment and various existing applicable laws and policies are fully described is section 9.3 of the Amendment. Section 9.3.3.1 addresses marine mammals and endangered species, while 9.3.4.4 deals with coastal zone management program consistency.

The range of surfclams and ocean quahogs with that of marine mammals and endangered species overlap to a large degree, and there always exists some very limited potential for an incidental kill. Except in unique situations (e.g., tuna-porpoise in the central Pacific), such accidental catches should have a negligible impact on marine mammal/endangered species abundances, and the Council does not believe that implementation of this Amendment will have any adverse impact upon these populations. While marine mammals and sea turtles may occur near surfclam and ocean quahog beds, it is highly unlikely any significant conflict between the fishermen managed by this Amendment and these species would occur. Clam vessels dredge at very slow speeds and healthy animals should have no difficulty avoiding these vessels. Additionally, surfclams and ocean quahogs are benthic organisms, while marine mammals and marine turtles are pelagic and spend nearly all of their time up in the water column or near the surface. The realized reduction in the number of fishing vessels resulting from the previous Amendment (Amendment 8) reduced the potential for the interaction with endangered species from a trivial to a very trivial level. Additionally management of these two bivalves are in the EEZ only and the only listed endangered fish species, shortnose sturgeon, practically never ventures far from its riverine existence.

The FMP was reviewed relative to CZM programs of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina. Letters were sent to all of the States listed above. The letters to all of the States stated that the Council concluded that Amendment 9 was consistent to the maximum extent practicable with the State's CZM program as understood by the Council.

10. EFFECTS ON FLOOD PLAINS OR WETLANDS

The adopted management measures or their alternatives will not adversely affect flood plains or wetlands, and trails and rivers listed or eligible for listing on the National Trails and Nationwide Inventory of Rivers. Management of these two bivalves are in the EEZ only.

11. LIST OF AGENCIES AND PERSONS CONSULTED IN FORMULATING THE PROPOSED ACTION

In preparing the Amendment, the Council consulted with the NMFS, the New England Fishery Management Council, the South Atlantic Fishery Management Council, the Fish and Wildlife Service, the Department of State, and the States of New York, New Jersey, Pennsylvania, Delaware, Maryland, and Virginia through their membership on the Council. In addition to the States that are members of this Council, Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, and North Carolina were also consulted through the Coastal Zone Management Program consistency process.

12. LIST OF PREPARERS OF ENVIRONMENTAL ASSESSMENT AND PLAN AMENDMENT

The Amendment was prepared by a team of fishery managers and scientists with special expertise in surfclam and ocean quahog resources including:

Mid-Atlantic Council Surfclam and Ocean Quahog Committee - Dr. Nancy Targett (Chair, DE), W. Peter Jensen (MD), Alan Weiss (PA), John Bryson (DE), and Dr. Gordon Brady (VA).

Mid-Atlantic Council Surfclam and Ocean Quahog Advisors - James Bailey (ME), Allan Merchant (ME), George Richardson (RI), Robert Burgess (NJ), Warren Alexander (NJ), Frank Risdon (NJ), Thomas Alspach (MD), Joe Garvilla (MD), Walter Gordon (MD), David Wallace (MD), and David Martin (MD).

NMFS NEFSC staff - Drs. Terry Smith, James Weinberg, and Steven Murawski.

MAFMC staff - David R. Keifer, Dr. Thomas B. Hoff, Dr. Christopher M. Moore, Richard J. Seagraves, Jose L. Montenez, and Clayton E. Heaton.

13. FINDINGS OF NO SIGNIFICANT ENVIRONMENTAL IMPACT

For the reasons discussed above, it is hereby determined that neither approval and implementation of the proposed action nor the alternatives would affect significantly the quality of the human environment, and that the preparation of an environmental impact statement on the Amendment is not required by Section 102(2)(c) of the National Environmental Policy Act nor its implementing regulations.

_____ _____

Assistant Administrator for Fisheries, NOAA Date

APPENDIX 3. HEARING SUMMARY AND RESPONSE TO COMMENTS

Hearing Amendment 9 to Surfclam Ocean Quahog
Doubletree at Philadelphia Airport Philadelphia, PA
Tuesday 5/14/96

Hearing called to order by Dr. Nancy Targett at 6:10 p.m., who presented opening comments. Dave Keifer presented the Draft Plan.

Attendees present: Dr. Jim Gilford, Ed Watson, Dave Wallace, Pete Jensen, Dr. Emery Anderson, Reb Bryant, Dr. Lee Anderson, Lou McCullough, and Alan Weiss.

Staff present: Dave Keifer, Tom Hoff, Joanna Davis, and Kathy Collins.

Dave Wallace (Wallace & Associates, Salisbury, MD): Represents Ad-Hoc Committee of surfclam/ocean quahog industry. Strongly urges that the preferred overfishing alternative ($F_{25\%}$) for quahogs be the same as for surfclams and be changed to $F_{20\%}$.

Hearing adjourned at 6:20 p.m.

Council's response is that their Scientific and Statistics Committee recommended the use of $F_{25\%}$ because of the longevity (200 years) of ocean quahogs. The Council concurs and believes a more conservative threshold is necessary for ocean quahogs than is needed for surfclams.

No written comments were received.

APPENDIX 4. GLOSSARY OF TECHNICAL TERMS AND ACRONYMS

Act (MFCMA) - the Magnuson Fishery Conservation and Management Act of 1976, as amended, 16 USC 1801 et seq.

Bushel (bu) - a standard unit of measure presumed to hold 1.88 cubic feet of surfclams or ocean quahogs in the shell (1 bu. of offshore surfclams = 17 lbs. of meats) (1 bu. of ocean quahogs = 10 lbs. of meats).

Cage - a container with a standard unit of measure containing 60 cubic feet. The outside dimensions of a standard cage generally are 3' wide, 4' long and 5' high.

CFR - Code of Federal Regulations.

Council (MAFMC) - the Mid-Atlantic Fishery Management Council.

CPUE - catch per unit of effort.

Dealer - a person who receives surfclams and ocean quahogs for a commercial purpose other than transport on land and who does not remove them from the cage.

Fishing Trip - a departure from port, transit to the fishing grounds, fishing, and returning to port.

Exclusive Economic Zone (EEZ) - the zone contiguous to the territorial sea of the US, the inner boundary of which is a line coterminous with the seaward boundary of each of the coastal States and the outer boundary of which is a line drawn in such a manner that each point on it is 200 nautical miles from the baseline from which the territorial sea is measured.

GRT - gross registered ton.

MSY - maximum sustainable yield. The largest average catch of yield that can continuously be taken from a stock under existing environmental conditions.

Natural Mortality - deaths from all causes except fishing, including predation, senility, epidemics, pollution, etc.

NEFSC - the Northeast Fisheries Science Center of the NMFS.

NMFS - the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration (NOAA).

Notification Area - an Area within which a vessel may not fish for surfclams prior to the vessel's owner or operator notifying the Regional Director pursuant to this FMP.

Off loading - to separate physically a cage from a vessel such as by the removal of the

sling or wire used to remove the cage from the harvesting vessel.

OY - Optimum Yield.

Personal Use - harvest of surfclams or ocean quahogs for use as bait, for human consumption, or for other purposes (not including sale or barter) in amounts not to exceed 2 bushels per person per trip.

Processor - a person who receives surfclams or ocean quahogs for a commercial purpose and removes them from a cage.

Regional Director (RD) - the Regional Director, Northeast Region, NMFS, One Blackburn Drive, Gloucester, MA 01930-2998. Telephone 508-281-9250.

Stock Assessment - the NMFS biological assessment of the status of the resources. This document provides the official estimates of stock size, spawning stock size, fishing mortalities, recruitment, and other parameters used in this Plan. The data from these assessments shall constitute the "best scientific information currently available" as required by the Act.

Territorial Sea - marine waters from the shoreline to 3 miles seaward.

USDC - US Department of Commerce.

Year Class - the fish spawned or hatched in a given year.

Yield Per Recruit (YPR) - the expected yield in weight from a single recruit.